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More Professional

Users, Suppliers Waking Up to Reality of Suits

By David H. Greenberg
Special to Computerworld

A new growth area relating to computers within the next 10 years will be lawsuits against computer companies. There has been a twofold problem to date in holding down this new "growth industry."

First, the standards and levels of performance have been so low that what would ordinarily generate a lawsuit in another industry becomes acceptable in the computer industry.

Second, lawyers have not understood the industry, its terms, standards and inner workings.

A closer look at what has been violated in regard to the standards and levels of performance reveals that the laws to be applied have been in effect for years. They include negligence, breach of contract, breach of warranty, product liability, fraud, misrepresentation and invasion of privacy.

In most business agreements the parties promise

Spotlight on User's Lib

to deliver a specific item or to perform a specific task, at a specific time, at a specific place and at a specific price. If any one of these promises is broken, a breach of the contract occurs and a lawsuit develops.

Apply these standards to past performances of hardware manufacturers and determine how many lawsuits that could have been filed, never have. The possibilities are astounding.

Negligence is conduct falling below the standard of a reasonably prudent man under like circumstances. Apply this as a test to performances of independent software firms and contract programmers.

How many times has a programmer's performance fallen below the standards of a reasonably prudent programmer?

Fraud and misrepresentation? How many computers have been delivered without the explana-

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'Questions' Extend Data Bank Hearing

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. The current hearings on "Computers, Data Banks and the Bill of Rights" have generated "more questions than answers to questions," and, as a result, additional sessions will be added to the original hearing schedule.

So said Lawrence M. Baskir, the chief counsel for the Subcommittee on Constitutional Rights, who also told CW that Sen. Sam J. Ervin Jr. (D-N.C.), who is conducting the hearings, wants more witnesses from the Department of Defense and possibly the Justice Department to appear.

Meanwhile, in testimony during the third week of hearings last week, a senator and a former U.S. attorney general differed as to how to protect an individual's privacy, and a current Justice Department official indicated that his agency would oppose legislation that "would effectively impair" the government's investigative activities.

Sen. Charles Mathias (R-Md.) called for congressional controls.

Nicholas DeB. Katzenbach, general counsel of IBM and a former attorney general, said that regulation is difficult and only a partial solution. He also suggested that individuals should access files other than those included in a criminal investigation.

But William H. Rehnquist, presently assistant attorney general, office of legal counsel, said the department "will vigorously oppose any legislation" which might open the door to "unnec-

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Computer and the Corn

Stars of "Hee Haw" television series seem engrossed watching panel lights of IBM 360 which is used to edit taped segments of the show. (Story, Page 6)

'Taxi-Meter' Data Rate Worries Computer Users

By Ronald A. Frank
CW Technical News Editor

LOS ANGELES Strong opposition by computer users against a proposal to meter local data calls has forced postponement of the issue before the California Public Utilities Commission (PUC).

More than 20 user complaints were sent to the PUC in response to a commission report blaming computer access lines for overloaded telephone conditions.

The PUC report said the growth of computer and other data communications has imposed difficult service problems on the telephone system.

The report, released last month, proposed a taxi meter principle for all data user calls at a suggested intrastate rate of 30 cents per half hour.

This measured data usage charge would be levied "for either originating or terminating communications."

This could technically mean both the sending and receiving data subscriber would be charged for transmission of the same message.

The postponement was ordered by PUC Commissioner Vernon Sturgeon last week after GE, Com-Share, Adapso and other users voiced their opposition.

Proper Notice

Sturgeon told CW that most users felt they had not been given proper notice of the issues.

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Smallest 370 Yet Offers ICA Option

By Frank Piasta
CW Staff Writer

WHITE PLAINS, N.Y. - With the announcement last week of the communications-oriented 370/135, IBM is closing the size gap between the 370 series and its recently enhanced System/3 Model 10.

Together with the expected increase in performance from its solid state memory and a price lower than the 360/40, the new system incorporates an Integrated Communications Atachment (ICA) that permits direct connection of eight low- and medium-speed communications lines.

Intended by IBM as a step-up for 360/25 and 360/30 users, the 135 offers a maximum memory capacity of 240K bytes, nearly four times as large as the 30. The increased capacity, together with the standard OS/DOS compatibility, will make it easier for users to upgrade to the more powerful OS software from DOS.

Controller Eliminated

The 135 follows the lead of the 145 in offering as an option the Integrated File Adapter, (IFA), thus eliminating the controller in configuring a 2314 disk storage system.

Unlike the 145, however, which can attach as many as eight 2314 drives to its IFA, the 135 IFA has a maximum capacity of five.

The 135 user will also have the option of using IBM's latest disk device, the high-speed, high-capacity 3330 under either OS or DOS control.

The Model 135 is available in four main storage sizes ranging from 96K to 240K bytes. Read cycle time is 770 nsec and write cycle time is 935 nsec. The 145 read time is 540 nsec and each cycle moves two bytes.

As in the 145, microcode is used for system control functions and some optional features, and is stored in Reloadable Control Storage (RCS). Smaller than the 145's 32K to 64K capacity, the standard 24,000 byte capacity of RCS can be expanded to 36K or 48K bytes.

The microcode required for a specific configuration is provided in a small disk cartridge. The contents of the disk are loaded into the RCS through a small disk drive in the 135 console. The execution time for a microinstruction ranges from 275 to 1,430 nsec, depending on the operation performed. Times on the 145 range from 202.2 to 315 nsec.

The ICA is a combination of microcode and circuitry that eliminates the usual need for a separate control unit. Communications with a wide variety of remote devices over private, leased or switched telephone

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On the Inside

Sigma 8 Doubles Processors for Scientific Application

EL SEGUNDO, Calif. – By incorporating instruction lookahead techniques, adding byte string manipulation and doubling the number of processors, the new XDS Sigma 8, designed mainly for time-sharing and scientific use, has approximately double the power of the Sigma 5, according to the company.

Processor characteristics are similar to the 5 with a cycle time of 900 nsec. The system can be equipped with from 16K to 128K of core memory. Interleaving is standard. All memory is directly addressable by both the CPU and programmable I/O processors (IOP) to control peripherals.

The Sigma 8 is compatible with the Sigma 5 and Sigma 9, allowing the user a logical upward progression, XDS said.

The 12-port memory can support one main processor and up to 11 IOPs. Two types of IOPs are provided, a two-channel multiplexer that can handle 32 devices and a transfer rate of 900K byte/sec, and a high-speed IOP, designed for use with fixed-head disks, that transfers data up to 3 Mbyte/sec. Any combination of IOPs can be used.

Reliability and maintainability features of the Sigma 8 include snapshot registers, automatic error logging, system partitioning capabilities and parity checks on all data and addresses communicated between memory and processors. These features, when combined with Sigma 8's advanced diagnostic programs, maximize computer reliability, XDS said.

Additional CPUs can be coupled to the Sigma 8 to accommodate large-scale tasks, such as processing networks.

The Sigma 8 is compatible with all existing XDS peripheral devices; user programs now running on Sigma 5 computers that use XDS monitors will also operate without alteration on the Sigma 8, XDS said.

A typical Sigma 8 computer system with 256K bytes of core memory, 56 Mbytes of disk storage, line printer, card reader and punch, two tape units, and I/O typewriter is priced at about $800,000 and will lease for $19,000/mo on a four-year lease.

First deliveries of the Sigma 8 are scheduled for the third quarter of 1971.

370/135 Has Integrated Communications Attachment

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lines is possible. The ICA performs the tasks of adapting transmission code to computer code, grouping signals from multiple lines for concurrent handling by a multiplexer channel and controlling the flow of data to and from the computer, IBM said.

The eight low- and medium-speed lines that can be handled by the 135 attachment are less than the 24 low-speed and two medium-speed lines the 360/25 can handle.

Because it can handle a mixture of asynchronous or higher-speed binary synchronous communications lines, the 135 ICA can be used with almost all IBM terminals. It can also be connected to other computers.

The 135 can have either one or two high-speed channels, with a total throughput rate of 2.4 Mbyte/sec, half that of the 145, and four times that of the 360/30. Block multiplexing is a no-cost option.

As with prior 370s, the 135 will be able to use any existing 360 software, running under either OS or DOS. The OS/DOS compatibility feature is standard, and 1400 series emulation is a no-charge option.

The 135 incorporates CPU retry which allows the computer to continue processing despite certain intermittent errors; error correction code circuits that automatically correct single-bit errors and detect all double bit and most other multiple-bit errors; and program-assisted retry of channel errors.

Retain/370 is available to rental and purchase users with an IBM maintenance agreement. It enables the on-site customer engineer to describe hardware or software problem symptoms to technical support center personnel.

The 370/135 can utilize all of the peripherals available for the larger 370s, including the high-performance 3330 disk system.

Price Summary

Monthly rental for typical configuration of a 370/135 will range from $9,870 with 96K of main storage to $22,600 for 240K bytes. Purchase prices range from $475,000 to $1,068,000. The ICA rents for $200/mo to $600/mo and sells for $9,880 to $29,650. The IFA for use with the IBM 2319 disk will rent for $475/mo, with a purchase price of $23,465.

The 370/135 offers improved performance and communications capabilities to users of medium-size and smaller IBM computers.

First customer shipments of the 370/135 are scheduled for May 1972.

Users, Suppliers Learn Reality of Suits

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tion that software costs will exceed hardware costs or that the language the users plan to write in is not compatible with other computers.

How many programming firms have delivered programs that won't work or are poorly documented? How many sales representatives have presented themselves as experts either in the computer field or in the user's industry? How many times have users heard they will get faster, cheaper and more meaningful information only to receive slower, more expensive and garbled information?

Professionals

The computer industry considers its people to be professionals. Yet professionals are sued constantly. Doctors, lawyers and accountants carry malpractice insurance. This insurance is a must and very expensive to obtain. How many programmers carry malpractice insurance?

What about damages? Damages can include not just the cost of rewriting a program or the delay in receiving some hardware but also lost data, lost sales by the customer and the closing of a plant because of inventory shortage.

In the final analysis the actual and moral responsibility lies with the business executives. So few business executives really understood computers to begin with that when breach of contract, negligence and fraud arose they didn't recognize it or were ashamed to admit it. How then could they turn the matter over to their attorneys? Even if an executive had the courage to raise the question with his attorney, there were too few attorneys in the country who knew what kind of questions to ask.

There are now more and more executives willing to admit they've been had. Also, there is a small but growing experienced group of lawyers who can speak the programmer's language.

These lawyers can ask the right questions; they can get through the technical language, they can separate performance from breach and negligence from superior performance.

You can analogize the computer industry today to the days when airplanes crashed and it was all part of the game. Today, when an airplane crashes, everyone gets named in the lawsuit as a defendant, except the luggage attendant. The day is fast approaching when computer crashes will no longer be considered all part of the game.

David H. Greenberg is a practicing attorney in Beverly Hills, Calif., a member of ABA, California Bar and Los Angeles County Bar.

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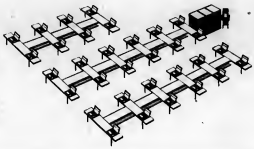

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Justice Opposes Laws Limiting Activity

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ensary and unmanageable judicial supervision."

Stating that the Justice Department has taken "a quantum jump forward a national criminal justice data bank," Mathias said that in his judgment "it is not only proper but essential for Congress to enact controls over, at minimum, three types of (these) systems:

- All those developed and maintained by agencies of the Federal Government.
- All those operated by state and local agencies but supported wholly or partly by federal funds.
- All those interfacing with federal systems."

Definite Standards

The Maryland legislator said that by enacting definite standards for federal data banks "Congress can inject order into operations now subject to great misunderstanding and suspicion, and promote public confidence in those data collection systems which are necessary. By imposing basic requirements on other systems involving federal funds or imposing linkages, Congress can guide the states and take a long step toward ensuring that any state or local data bank abuses or excesses will remain localized."

Sen. Roman L. Hruska (R-Neb.), a member of the subcommittee, discussed Mathias' recommendations for controls. Indicating that safeguards are necessary, Hruska cautioned that "we should have been aware that one of the big bugaboos in law enforcement is a threat or potential of a national police force."

IBM Spokesman

IBM's Katzenbach attempted to put computer usage into perspective, explaining that "like any other tool (it) is controlled by men and does only what it is told."

Discussing system security within IBM, Katzenbach said that the company maintains information "records of the sales achievements of our various branch offices. A branch manager is permitted only to review the files of his office, but a district manager can review the files of all the branch offices in his district. He cannot, however, review the records of branch offices outside his district."

The former attorney general also said that "where government or private industry maintains files containing personal data, the individual should be given maximum access to files containing information about him wherever that information can be used to his detriment.

"Obviously, I do not include criminal investigation files and I think there are problems where files contain opinions or judgments from third persons not capable of objective verification. By and large I think that access is for the sound personnel and business practice."

Following Katzenbach, two members of the Justice Department gave their testimony.

"We believe that full utilization of advanced data processing techniques is by no means inconsistent with the preservation of personal privacy," Rehnquist said. "We reject the suggestion that the mere potential for abuse of these technological advances is a sufficient reason in itself to dispense with their use in the investigation and prosecution of crime."

Explaining that the Executive Branch of government has responsibility for preventing as well as prosecuting crime, Rehnquist said that the responsibilities for law enforcement in the Federal Government were "far-flung" and that it "would scarcely be surprising if there were not isolated examples of abuse."

Rehnquist said that he did not mean to suggest that Justice "would adiamantly oppose any and all legislation on this subject.

"But it will come as no surprise, I am sure, for me to state that the department will vigorously oppose any legislation which, whether by opening the door to unnecessary and unmanageable judicial supervision of such activities or otherwise, would effectively impair this extraordinarily important function of the Federal Government."

Richard M. Velde, associate administrator of the Law Enforcement Assistance Administration in the Justice Department, said that his organization had found that one of the most serious deficiencies throughout the criminal justice system "is the great lack of reliable and timely information," adding that "we simply don't have enough nationwide information today."

The second day of last week's hearings, Dr. Robert R.J. Gallati, director of the New York State Identification and Intelligence System (Nysiis), told the subcommittee that he thinks that computerized criminal justice information systems such as Nysiis "are essential for the effective administration of criminal justice."

He added that such systems could be developed and operated with "adequate security against unreasonable invasions of individual privacy."

Senator John V. Tunney (D-Calif.), a subcommittee member, opened the third day of hearings by asking the Senate unit to require the Small Business Administration to answer questions regarding "snooping" activities involving victims of the recent Los Angeles earthquake.

Tunney said that the SBA is violating individual privacy by inquiring as to the income and the character of applicants for disaster relief.

In a written statement presented to the subcommittee for insertion in its formal record, the Business Equipment Manufacturers Association said that it believes the "protection of privacy cannot be the responsibility of any one specific group."

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'Taxi-Meter' Data Rate Worries Computer Users

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His postponement does not prejudge the proposal but the PUC may order a separate hearing on the measured rate for data users, he said.

To apply a measured rate only to data users was called discriminatory by some users.

The report was prepared by the PUC staff in connection with a request for increased phone rates by Pacific Telephone and Telegraph Co.

But even Pacific Bell, which had not requested a special rate for data users, was surprised by the report. A Pacific Bell spokesman told CW that his company had not yet taken a position but it probably will not agree with the measured rate plan.

In amplifying the reasons for the measured rate, Paul Popenoe Jr., PUC staff engineer and author of the report, said that "telephone company central offices have been overloaded by data users, so regular customers can't get through.

"The telephone company is very reluctant to move ahead because they have been intimidated by the computer industry, he said.

News Wrapup

IBM Cuts Prices on S/3/10 CPUs

WHITE PLAINS, N.Y. – IBM has reduced purchase prices on two models of System/3 Model 10 processors and increased maintenance charges on five models.

The purchase price of the 16K card processor will now be $20,800 and the 16K disk version will cost $26,925, amounting to about 7%. The 32K card CPU has been reduced to $37,700 and the disk version to $43,825, about a 21% reduction.

Monthly maintenance charges on purchased processors, except for the 48K versions, have been increased an average of $18, with the actual figures ranging from $11 for the 8K models to $26 for the 32K models.

Price reductions are retroactive to March 1. Maintenance increases will be effective July 1.

Justice Department Investigates Alioto Claim

WASHINGTON, D.C. – The Department of Justice has investigated an allegation by Mayor Joseph L. Alioto of San Francisco that disclosures from confidential files of the department and other government agencies were made illegally to *Look* magazine.

Alioto's remarks came before the Senate Subcommittee on Constitutional Rights [CW, March 10].

Assistant Attorney General at Justice William H. Rehnquist said that one of the San Francisco agents who had been a source of data for the controversial article, alleging that Alioto had organized crime connections, furnished information without FBI and Justice Department authorization.

"Appropriate disciplinary action was taken against the agent in question, and he retired."

Rehnquist added that "at no time were official files of the FBI furnished to *Look*."

Nixon Plan to Retrain Jobless DP People

WASHINGTON, D.C. – Out-of-work computer people will benefit from a pilot program announced by the Nixon Administration at a White House press briefing recently.

Malcolm J. Lovell, assistant secretary of labor for manpower, said the Departments of Housing and Urban Development and Labor were putting $1.3 million into a pilot program to retrain 400 scientists, engineers and highly technical people – including jobless computer people – for work in areas of public need. "We want to see if this kind of effort is productive," he said, adding, "clearly, it's just a beginning."

ISD Charges UCC, Workers in Program Theft

PALO ALTO, Calif. – Following the arrest of a University Computing Co. programmer for the alleged theft of a proprietary program from Information Systems Design [CW, March 10], ISD has filed a civil complaint against the programmer, UCC and another UCC employee.

At his arraignment the programmer pleaded not guilty. The case is precedent setting in that it is the first test of a law revision passed in the state in 1967 which determined that ideas as well as physical property can be stolen.

The suit is over alleged theft of trade secrets.

ISD's suit contends that the defendants, using code numbers and data intended for use by ISD's customers, pilfered valuable programs from ISD's time-shared computer.

A UCC spokesman said that the suit is "in support" of the criminal action. He noted that UCC "does not consider plotter programs to be unique . . . [or] have a high degree of proprietariness."

The Texas computer utility has had plotter programs for many years, he said.

UCC intends to "strenuously defend" itself in the action.

ISD President George T. Steeley claimed that the programs gave ISD a definite competitive advantage in certain sale situations.

N.Y. Generator Plant in Operation Again

NEW YORK – The power problems here have been eased somewhat, with the restoration of a nuclear generator that had been out of service since May 20.

The Indian Point 2 plant is now producing 260,000 kW, or nearly 3% of Consolidated Edison's capacity.

The utility has placed a tentative "hopeful" date of late April for the million kilowatt Ravenswood generator to be back in service.

Killer Sees Victim as 'Impersonal' Machine

CHICAGO – A psychiatrist here explains the phenomenon of a killer referring to a victim as a computer as a classic example of depersonalization.

Susan Atkins, convicted killer of actress Sharon Tate, said, in testifying before a Los Angeles jury deciding her sentence, that she didn't relate to Sharon Tate. "Words came out of her mouth like she was an IBM [machine]."

"It is," said a Chicago psychiatrist, who asked his name be withheld, "a common thing for a killer to deny his victim basic humanity because it is extremely difficult for a rational human being to take the life of another. In World War II we were taught to kill the 'enemy,' not that particular German or Japanese human being.

"To the uninitiated, there is nothing more impersonal than a machine that 'thinks,' a computer."

Not Corny to 'Hee Haw'

TV Show Keeps Together With Computers in the Hay

By Phyllis Huggins
CW West Coast Bureau

HOLLYWOOD, Calif. – "Hee Haw," CBS' popular cornball entertainment show, doesn't "ho hum" computers. Instead it is probably the only show in the business put together by computers.

Computers are found in the hayseed for only one reason – Sam Lovullo, the producer, who used to be in systems work at CBS for cost control. "Hee Haw" was an ideal setup for moving into the computer area since it is composed entirely of segments. Maybe 150 or 200 scenes of one particular type, say the barbershop scene, are shot in one long stretch.

"We then have the problem of how to put together each show from all the different pieces. It used to be that a production assistant would sit in the control room and log and index all the scenes. We would then have to search the tapes to find the particular one we wanted.

"Producers would frequently be up until three in the morning trying to put one show together. Computers have changed all this," he said.

'Only Way'

"Laugh-in," which is also a segment show, is not computerized and it uses six film editors to help put the program together. As one CBS official explained, "Computers are the only way this type of show can be put together economically."

Lovullo explained that the biggest problem was convincing people that the computer method would work. "When you're working with creative people, they are very apprehensive." Another problem was trying to talk to computer people. "I could talk to them because I had worked with computers but they did not understand our business." To overcome this, CBS gave a computer specialist weeks of in-house training to learn the business. The system took one and one-half years to develop.

How It Works

As each segment is filmed, it is automatically clocked on the tape for time length and segment type. Some segments run only one second while songs take two and one-half minutes. There are 60 classifications – haystack jokes, grocery store jokes, etc.

These classifications always existed but had never before been figured out as such until the computer system required organization. From this base an inventory control system was setup which includes ratings for the segment and special characteristics, such as animation, were used.

All the filming is done in Nashville, Tenn. By filming one half or all of one type of sequence for a season at one time the cost of bringing in people and setting up backgrounds during each filming is eliminated.

All songs are done in one period of time since all the musicians are there and don't have to be brought together each singing session. The films are then flown to Hollywood where the show is put together.

Inventory

With a "crow shot" a request is cued to the computer which prints out what is in inventory on that particular type of sequence. When a segment is selected it is automatically deleted from inventory. The computer also keeps track of the times of the segments considered and prints out the total time for the show.

Stewart Wilson of NLT Computer Services Corp. in Nashville is the computer specialist on the job. Referring to the computer, he says, "They couldn't get along without it now." Lovullo, whose brainchild it was, says, "This is only the beginning."

Computer May Guide MDs

FRANKFURT, Germany – Future brain surgery may be supervised and planned with the aid of a computer in a stereotactic operation.

The computer will constantly measure and evaluate electrical impulses, giving surgeons a continuous picture of the state of the electricel stimuli in the brain.

Justice to Provide States With Software To Build Data Banks on Organized Crime

By Joseph Hanlon
CW Staff Writer

WASHINGTON, D.C. – The stores where suspected Mafia members shop, the restaurants they patronize, the businessmen they deal with, their doctors and dentists, and even the victims of their crimes will be listed in computer data banks in several states throughout the country.

A prototype Organized Crime Intelligence System (Ocis) developed by the Justice Department, in cooperation with six states, is now in operation on an IBM 360/50. When the system is fully debugged and documented later this year, the software will be made available free of charge to the six states, and later to others who are interested.

Using the Justice software, each state will use its own computers to set up a central repository for its organized crime information. The states must supply their own intelligence data, however, because none will come from the Justice Department.

Many of those persons listed in the data banks may be innocent and unaware of their listing. Tight security will be imposed on the computer systems to protect reputations but there is some concern, however, that the security precautions are not tight enough. A Justice Department official conceded that the computer systems alone "will not prevent reports from leaking out through corrupt officers."

Furthermore, in some states the computer data banks may be used to check license and possibly job applicants, and it is not clear whether individuals will have a right to contest inaccurate or misleading data.

Powerful Weapon

Much of the data to be computerized already exists in manual files, but the sheer bulk of information has made the files inefficient. Thus, the computers, with their ability to do high-speed searches and complex analyses and correlations, are likely to become powerful weapons in the war against organized crime.

One example shows both the potential and the dangers. A dentist who has several Mafia members as patients might be a good source of information, or might be connected to organized crime himself.

At present, however, the dentist would be listed in the file of each of his Mafia patients but probably would not have his own file. Thus, officials might never realize his importance. With the computer, it would be possible to print out a list of all of his dealings with suspected Mafia members, even though he was never a target of investigation himself.

Built-In Safeguards

The computer system now in use at the Justice Department contains several built-in safeguards which will also be included in the package passed on to the states.

The Justice data bank is tied to no other computers, and there are no remote terminals – users must go to the computer center.

The software contains a procedure whereby the computer automatically adds to each dossier the names of everyone who has had direct or indirect access to the dossier; has approved someone else's access to the dossier; has added information to the dossier; or has investigated the individual without adding to the dossier.

Filing user names is designed to make it easy to trace a leak, but the system has one serious weakness – it does not require accurate identification of the user: the system does not use machine-readable ID cards or other positive identification, and trusts that the user signs on correctly.

It is not clear what rights applicants will have to defend against such data. One state reported that it would only release to licensing agencies data for which they could supply a first-hand source, such as a policeman, who could testify at a hearing.

Clear Job Applicants?

Finally, there is a real possibility that the files will soon be used to clear prospective employees for jobs in brokerage houses and elsewhere. Even if the rules do not now permit such use, precedent suggests that it will happen eventually.

Ocis is not intended for instantaneous response, and is a batch processing system. Data in the data bank is stored off-line and only input as needed. At Justice, Ocis shares the 360/50 with other Justice Department users.

University Gasps for Core

KINGSTON, R.I. – Input uncertainties and a computer "gasping" for more core choked the student scheduling program at the University of Rhode Island at the beginning of this semester.

Hundreds of students had to be scheduled manually while standing procedures were altered.

Cause of the mixup was apparently "running out of core," according to Tom D'Ambria, assistant registrar at URI. He said the scheduling program, Gasp, obtained from MIT, was running on 512K of core on the college's IBM 360/50, but that wasn't enough.

With class conflicts and size limitations included in the program, and with no signal that all available storage had been used up, there was no way to know of the failure until too many students began walking into classrooms, D'Ambria explained.

The assistant registrar noted the college has sufficient expertise to patch the program, and that more core would be added to avoid a repetition.

"We need to input data in smaller blocks," D'Ambria added.

Some professors agreed to requests that class sizes be increased, in order to alleviate the rescheduling process.

Head of Police DP Strives for Rigid System Control

CW Midwest Bureau

KANSAS CITY, Mo. – Melvin F. Bockelman is a DP professional who believes in identifying the problems facing him, rooting out their causes and then solving them. His attitude – and he won't say whether he was born with it or whether 20 years in the U.S. Air Force put it into him – has served well in his DP career.

"Back when I joined the Air Force," he says, "they called it 'statistical control.' By the time I got out, it was 'data automation.'"

Mel Bockelman shows how fast a report on a wanted man can be gotten "on screen."

With his urge to seek and solve problems and with his years of experience in "data automation," Mel Bockelman was well equipped to fit into his first civilian job: the manager of the computer facilities of a metropolitan police force, a job he has no intention of leaving.

When Bockelman reported to the Kansas City Police Department to head the emerging DP section as a civilian employee, he received a single directive from his chief of police, Clarence M. Kelley.

"Build a DP section," Kelley told him then, "that will provide information to the officers in the field on a priority basis."

And that is exactly what Mel Bockelman built.

DP Profile

The department now operates a real-time information net that is reputed, by experts in that field, to be one of the best. Its prime function is to serve the policeman on the street, to feed him the information that, at least, makes him more efficient and effective, and that could save his life.

Now Bockleman had all the problems he could want.

He recognized both the individual's right to privacy as well as the need of the policeman to have quick access to pertinent information. He had the management of an information dispensing medium that was historically, in civilian life anyhow, a nine-to-five operation, and which served a user who considered a legal holiday a time for a lot of auto accidents instead of a day off.

He had the responsibility of building an effective and demandingly accurate system when the precedents for it were few and, sometimes, to him, inadequate.

Competent Workers

He solved a lot of his problems by finding and hiring people competent enough to develop the needed systems and who were dedicated enough to keep the net "on the air, 365 days a year, 24 hours a day."

Bockelman sincerely believes that the government (in this case, the police department for which he works) has an obligation to compile information which just happens to be on citizens.

While he believes the restriction of that right would condemn many government activities to inefficiency and uselessness, Bockelman also firmly believes that the gathered and maintained information should not be or become a threat to any man's rights.

For Bockelman, this is a continuing problem of unintentional error, usually in input; misuse of the collected data, both by authorized and unauthorized users; and intentional data change.

To guard against these problem areas, the police department has set up some very stringent rules for entry and access, including a continuing program of data verification against source documents and a continuing program of automatic logging of queries.

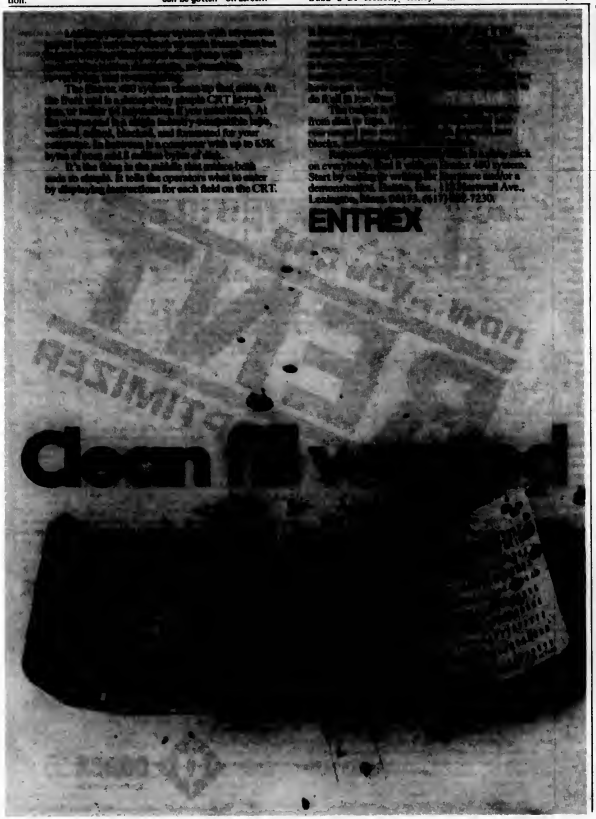
'Double Attack'

Feeling himself under "double attack," first for being in DP itself and second for being in police DP, Bockelman feels that the industry as a whole should help him solve his particular problem.

"I submit," he said recently, in a speech before ACM, "that if automated systems are to win public acceptance, our profession must convince the general public that we are quite seriously concerned with the rights and interests of those whose lives our systems record and, more importantly, that we have done something about it."

The challenge facing the computer industry, as Bockelman sees it, is not the proliferation of new technologies; it is "for those of us directly or indirectly involved with the computer to insure that automated information systems are rigidly controlled according to the ethical procedures of our society.

"To ignore this principle will only enhance the cause of anti-computerism and result in inefficiency for the whole society."



MORE POWER TO YOU. SYSTEM/370 MODEL 135.

You've probably heard a lot about System/370.

That it's faster. That it gives you more capability. That it's more reliable.

And now IBM announces the most advanced intermediate computer on the market.

System/370 Model 135. Just the right size for System/360 Model 25 and 30 users.

Model 135 is everything System/370 is all about. It's designed to give you a computer, that's easy to use, easy to afford, easy to move up to. And at the same time it opens up to you many more computer applications. Including remote computing.

NEW TECHNOLOGY MEANS GREATER SPEEDS, GREATER PERFORMANCE.

Model 135 uses monolithic circuitry throughout its memory and logic. This means it's more compact. More reliable. And faster.

In fact, Model 135's Central Processing Unit is up to 4½ times faster than Model 30's. Just the kind of speed you'll need, not only to process data, but to control many aspects of your business. The kind of speed to handle applications such as remote computing, scientific computing, data base applications, and time-sharing.

In short, Model 135 means your entry into more sophisticated kinds of computing.

If you're a retailer, you can use its inquiry capability to speed credit approval to your stores.

If you're a banker, you can use its remote computing capability to get the status on accounts from dozens of different branches.

Manufacturers will want to use it on-line to reduce the time it takes to process customer orders. Distributors will want to use it to keep them updated on what's in stock and to make their warehouses more efficient.

NEW STORAGE TECHNIQUE MEANS AN EASIER WAY TO DO MORE COMPUTING.

Model 135 also has reloadable control storage. This means most of the instructions for the system's features are on a tiny disk that slips behind a window in the control panel.

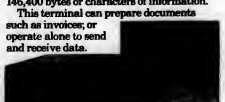
It allows you to attach terminals and disk drives without a separate control unit. Perform floating point calculations. Emulate 1401, 1440, 1460 programs.

THREE NEW PRODUCTS MEAN MORE PERFORMANCE OUT OF YOUR MODEL 135.

By using any or all of our three new computer peripherals, you can get even more performance from Model 135.

Our 3735 Programmable Buffered Terminal has a familiar typewriter-like keyboard and is controlled by its own programs. These are stored on a disk that holds up to 146,400 bytes or characters of information.

This terminal can prepare documents such as invoices; or operate alone to send and receive data.



Then there's our new 3505 Card Reader (below right). It races through 1200 cards a minute—faster than any other IBM reader. Its ability to read ordinary pencil marks will simplify the data entry procedures for many jobs, such as taking inventory.

Our new 3525 Card Punch (below left) lets you print and punch at the same time. You can print up to 25 lines of information on a card.

Both these new machines come in a variety of read and recording speeds. So you can choose the performance that suits you best.

IT'S EASY TO MOVE UP TO MODEL 135.

A lot of medium-sized companies will have good reasons for moving up to Model 135.

Like other System/370 computers, Model 135 is compatible with System/360.

You'll be able to use all of Model 135's computing capabilities almost from the day it arrives.

Our products change. But our philosophy doesn't. We want you to get the most out of your computer system.

IBM.

THE COMPANY BEHIND THE COMPUTER.

Editorial

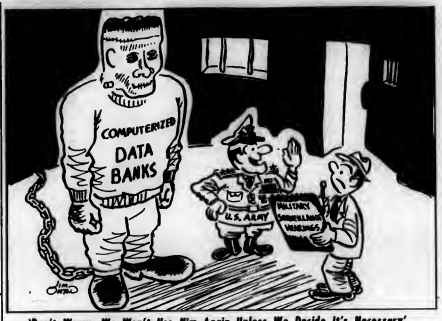
Realism vs. Romanticism

The romance between users and suppliers is over and the marriage has begun for real.

Users, who once considered computer systems exotic toys, now must depend on them.

The supplier who fails to deliver on time or at all because his hardware or software announcement was premature is no longer an object of sympathy. Now users, beset by their own very real problems, sue.

Computers began becoming full-fledged workhorses 10 years ago. It's about time users stopped treating them as fascinating but unreliable and experimental gadgets.



'Don't Worry, We Won't Use Him Again Unless We Decide It's Necessary'

DP Society Responsive To Needs of Unemployed

WASHINGTON, D.C. – Eleven persons including four women showed up here recently at an Association for Computing Machinery-sponsored professional placement seminar to help computer industry personnel who are unemployed, underemployed or about to lose their jobs.

The attendance was considerably smaller than the more than 150 who attended a series of five similar seminars sponsored by ACM in New York City, and points up the difference between the Washington employment market and other areas of the country.

D.C. Dote-Line By Alan Drettell

The presence of the Federal Government here ensures a degree of job security. As a result, unemployment in the Washington region is about half of the national average.

Another difference in the D.C. area is that most of the unemployed in the computer sector apparently come from the management side. A large number of small software and time-sharing companies, for example, have gone out of business, and many marketing staffers have been terminated by other private firms impacted by cuts in federal spending.

The 11 attendees at the Washington seminar were all senior computer people, many of them with a great deal of management experience. One, a 57-year-old former GE executive, had been earning a salary in the $30,000 range until last November when he was laid off. He has been looking unsuccessfully for various types of jobs in the industry – even applying for one offering $12,500.

Herbert Halbrecht, head of Halbrecht Associates, Inc., Greenwich, Conn., an executive placement firm, conducted the seminar, and said that despite federal law many companies discriminate against older employees.

He talked about the former senior systems man who had been earning about $17,000 with a large manufacturer and then two years ago got caught up in the fever of trying to "make it big like Ross Perot."

The systems man, with some friends, opened a software house, named himself vice-president for technical development and rewarded himself with a $27,500 salary. The recession closed the doors of the company and tossed him out on the streets.

"A prospective employer will not look closely at that man's most recent job or at his $27,500 salary. What he sees is an individual who was a $17,000-a-year senior systems man who may now be worth $18,000. That's a $1,000 raise for that guy," Halbrecht said.

From the tone of the questions asked by the 11 attendees, there is no doubt that the seminar was of help.

What came across quite clearly was Halbrecht's honesty in telling them what the problems are and how they might challenge them effectively. At one point he said, for example, that the best entree into a company is sponsorship by a friend "no matter what any search firm or employment agency tells you."

As Halbrecht stated, the trauma of unemployment in an industry never before faced with this dilemma is happening to "astonishingly good people." But what is most hopeful, I feel, is that ACM is doing something tangible to meet the needs of its members who suddenly find themselves out of work.

One could discourse interminably about what the effective role of a professional society should be. It seems to me that the most important is to be responsive to the people whose dues support it. ACM, through its professional placement seminars, is showing itself equal to the task. Some of our other professional organizations ought to take note.

Letters to the Editor

Part of DP Corps Need Filled

The headline, "How About a DP Peace Corps?", in your Feb. 17 issue prompts me to mention that an organization with some of the characteristics of the Peace Corps already exists to fill at least a part of the need that Dr. Gerald Estrin apparently had in mind.

The International Executive Service Corps, 545 Madison Ave., New York, N.Y. 10022, operates in more than 40 developing countries around the world, undertaking to provide skilled know-how to enterprises in those developing countries by giving them a chance to consult with men with extensive experience in U.S. companies – utilizing the know-how and skills involved in each case.

Most of the volunteers sent out by the International Executive Service Corps are, I understand, retired although I believe that at least a few of them are still in active business life. The volunteer receives no pay for his work, but does receive travel and living expenses for himself and his wife. Assignments average about three months in length.

The DP industry has not been in existence long enough to have a large body of retired professionals, but there must be some of them around.

Joseph H. Chaille

New York, N.Y.

Jobs Must First Be Available

I was very distressed by the Letter to the Editor from Herbert Drucker, which appeared in the Feb. 3 issue.

Here is an example of a group of well-meaning individuals who jump without proper background into the field of helping the disadvantaged. Setting up a course and teaching these people to be programmers without first finding jobs for the graduates is the worst thing that can happen.

It would be highly desirable if such projects followed the example of the Philadelphia and Sacramento chapters of ACM. In these places the well-meaning people first went out and investigated what jobs were available, got job commitments, and then set up a training program to train for the disadvantaged to fill these jobs.

In Philadelphia, we very rapidly discovered that programmers would not be hired but operators would. Therefore, our training program was set up to train operators. We have been very successful in obtaining jobs for our graduates; however, this year we are not running any training programs at all because of the unavailability of jobs.

Albert B. Tonik

Univac Division
Sperry Rand Corp.
Blue Bell, Pa.

Quake Didn't Hurt APL System

An article by Don Leavitt on page 15 of the Feb. 24 issue headlined "I/O Problem Shows Weakness of APL System" might have better been headed, to quote from the body of the article itself, "The Value of Good Planning at Any Installation."

Those unfamiliar with APL might conclude, wrongly, that the consequences of failing to maintain adequate backup procedures represent some sort of weakness of the APL system.

In fact, the APL system is so reliable that not even the recent California earthquake caused harm to bit or byte of the APL service operated by Proprietary Computer Systems in Van Nuys.

Joseph Mill
President

Computer Innovations
Chicago, Ill.

Isam Updating Explained

In the Dec. 30 Taylor Report you spoke of adding records to an Isam file. Specifically, "The tape had been previously sorted so that the records were presented sequentially in descending order so as to minimize the time involved."

I have heard of this method of adding to Isam files before but no one had been able to actually explain why the time savings came about. Might you be able to explain why, logically, Isam is more amenable to this "reverse" type of updating.

Also, what is the percentage of difference between adding a series of records to a given file in ascending, versus reversed, order?

Robert Caplan
Programmer

Stratford, Conn.

Taylor replies: Use of the descending sequence will prevent unnecessary retrieval taking place when two or more new records are put into an Isam overflow from a single prime storage area. The Isam overflow organization links records in an ascending sequence – such as 10, 13, 17 etc.

To place a new record in the string involves first retrieving all lower numbered records. To place '14', therefore, would involve retrieving both 10 and 13. If two new records are to be placed and if they are in ascending order – say 11 and 14 – record 11 will be retrieved after it has been put in the chain during the storage of 14.

If 14, however, is stored first, then no such unnecessary retrieval is necessary.

With regard to percentage differences, this depends upon the input. However, if an input is liable to packing distributions – such as if a series of nuclear physics books were suddenly added into your local library – then percentages of 200%-300% could occur.

Such overheads will only be a small part of the total overheads involved in the use of Isam, and should not make anyone forget about calculating the full portion involved.

The Standard the U.S. Navy Missed

Throwing Cobol Baby Out With Programmer Wash

The U.S. Navy knows what Cobol is. The start of Navso P-3063 "Fundamentals of Cobol, Programmers Reference" defines its virtue as being "close to having a computer language tailor-made to one's own needs, since it permits identification of many program elements to be made in English, and in a form readily understandable by the casual observer."

The Taylor Report
By
Alan Taylor, CDP

Yet, in practice, one of the most annoying parts about Cobol, as a programming language, is that its efficiency in communication is totally controlled by the programmer.

Some programmers write beautiful Cobol programs which allow you to pick them up, read them, understand them and understand the systems analysts' thoughts without any doubt whatsoever. This allows management to assume its responsibilities (an idea that I always welcome) while in no way restricting that of the programmer.

An alternative way which I see too frequently is to make the program completely indecipherable to anyone who has not attuned to the private coding system created by the Cobol programmer. Sometimes it has a beauty all its own – but the question remains whether it is English language programming? Indeed, is it Cobol?

This question came to my mind while I was reviewing some Cobol programs that had been prepared by a Naval Reserve unit.

The programs were practically unintelligible. The writer had gone out of his way to make certain that no one reading it would be able to determine easily what the program was doing. Yet at the same time, the program claimed to be written under a set of particularly promulgated standards.

Actually, there was a certain amount of virtue in the programmer's coding structure. It was an edit program that was checking the correctness of a number of different card inputs. What he had done was simply to disassemble everything into column codes and then test them against various expected ranges. The problem lay in the fact that the test was multilingual. On the one hand, it referenced items in physical position, and on the other, it gave test values related to data content.

It just made it quite unnecessarily hard to read and error prone for maintenance.

But apparently it had been written in accordance with Navy standards according to the program itself . . . so t became interested as to just what those standards are.

I checked these standards with Capt. Usher, USNR, who works with the unit, and also with the Pentagon, about just what Naval standards of program writing are. I found that there were none.

There were simply no standards as to how Cobol programs should be written. There was no requirement that they should be lucid, or that they should be able to be read. There was nothing in the standards whatsoever that prevented programmers from quite accidentally throwing the Cobol baby out with the programming bath water, simply by not realizing the basic Cobol documentation problem.

While writing good Cobol, one must realize that there are two types of human readers – the first programmer who is actually the programming, and other people who will later be maintaining, approving, understanding and generally having to take responsibility for the program. Both these readers should be considered, and, if you are going to put down a set of standards for program writing, like the Navy did, then I think you should include such standards.

What should such standards include? Well here are a few possibilities:

- Data names employed in tests shall be descriptive of the field content, not of the field position.
- Data names employed in computation shall be descriptive of the field content rather than of the field position.

I am not certain whether or not these are just parts of a general rule, that data names should always be descriptive of the field content. There may be some cases in housekeeping where there is no requirement for communication with management or with maintenance programmers. I have not been able to come up with such a possibility – but I have not been able to deny it either.

I do not think the programmer who wrote this program is to be blamed one little bit. He was given a set of standards and he obeyed them. They gave him an alibi – not a guide. The fault then must surely belong to the standard writers for failing to incorporate the necessary guidance in the standards.

And so let us offer a standard for Cobol standard writers:

"Cobol Programming Standards will include a requirement that the programs shall be written so as to facilitate casual observer understanding, unless an analyst-supplied guarantee that the program will never have to be read humanly is supplied. Programs which are not so guaranteed, and which are not written so as to provide such understanding, shall be rejected."

The sting, of course, is in the last three words. What is missing from the standards was not so much guidance to the programmer, but a statement as to what should happen if the programmer failed to perform the task as it was given.

My suggestion is that the program should be rejected. What are your ideas?

Letters to the Editor

Should DPMA Control Certification Process?

Alan Taylor's column (March 3) concerning the CDP qualifications and examination brings to mind the first time I heard of the certificate, and certain still-valid objections which were raised to it at that time.

The occasion was a Share meeting some years ago, I believe in Cleveland, at which a DPMA vice-president presented the then-proposed exam and certification program.

While the large audience had numerous technical objections to the exam, these were not the two major issues raised. (The proposed exam demanded "yes or no" answers to technical questions which then were still hotly debated among Share members.)

The first major objection was to an admitted policy of increasing the difficulty of the exam and the level of qualifications required to take it annually. In discussion it became obvious that the intent of the policy was to assure the bulk of the then-members of DPMA of certification, provided they took the exam promptly, while newcomers to the field would experience increasing difficulty in being admitted to the "guild."

The second major objection was to the expressed intent of the DPMA to bring pressure on governmental agencies to require CDP certification of personnel offered by bidders on applicable contracts, so that a "closed shop" could be obtained, making the certificate much more valuable.

As a whilom employer of DP personnel, I will continue to regard the CDP holder with suspicion as to motive and qualification, the level of suspicion being in inverse proportion to the date of the certificate.

I suggest that to be effective, the certification process be removed from DPMA control (and secrecy) and placed in the hands of an agency less open to conflict of interest on behalf of its membership. If this is done, and all those holding "grandfather clause" certificates then were retested, the certificate, for me, would hold considerable more validity.

John Seitz
Uncertified Data Processor
Lexington, Mass.

Fortran IV Problems

Exercises Promote Fluency in Language

By Walter J. Samek
Special to Computerworld

A Fortran IV Problem Solver, by William A. Manning and Robert S. Garnero, McGraw-Hill Book Co., 1970, 192 pages, $4.50.

This is an interesting little book designed to give the student of Fortran IV the opportunity to practice what he has learned in a course using some other text. I can say that it fulfills this purpose very well. It also agrees with my personal bias: that the letter O should receive the distinguishing slash and not the digit 0.

The book contains a review of the rules of Fortran IV plus many exercises, the conscientious completion of which will greatly aid the reader in becoming fluent with the language. The subject matter of the exercises is taken from both the business and the scientific fields; hence there should be enough material for all kinds of students.

The book can be used once only, because the student is led to do his work in the blank spaces left for this purpose, before checking the answers provided in the back of the book. A clever student will keep the completed book close at hand and use it to refresh his memory, once he has started programming "in earnest."

Walter J. Samek is employed at Combustion Engineering Inc. in Windsor, Conn.

COMPUTERWORLD

book reviews

Systems Analysis 'Tools' Receive Full Coverage

By Bernard J. Luskin and Robert E. Schaulis
Special to Computerworld

An Introduction to Business Systems Analysis, by Ronald J. DeMasi, Addison-Wesley, Reading, Mass., 1970, 206 pages, $8.95.

This book makes a valuable supplementary text for a professionally taught beginning course for aspiring systems analysts. It is particularly valuable in its treatments of what might be considered peripheral tools of systems analysis. Treatments external to any computer interface of a system is strong.

The direct interface with computers, today's normal environment for analysis, is sketchy, disorganized and in some areas non-existent.

Specific strengths of this work are in the areas of flowcharting, organization charts, document flow and particularly in forms analysis. Treatment of communications skills, analyst perceptions, and other essential non-tool factors in analyst success, is interesting, if sketchy.

The real weakness of the book, if one is looking for a self-contained "Systems Analysis I" text, is its dealing with the computer. A complete lack of mention of data elements, or any analysis on that level, is the book's outstanding void.

The global nature of the subject makes it practically impossible to achieve a good comprehensive treatment of "Systems," even at the introduction level. Instructors will and should use a multitext, multimedia, multi-experience approach toward this subject matter, keeping in mind that the most significant factors for analyst success probably are aptitude and not tools, and, therefore, cannot be treated.

Robert E. Schaulis is director, information services, and Bernard J. Luskin is vice-chancellor, educational development, Coast Community College District, Costa Mesa, Calif.

SYSTEM 2400, Data-Editor Configuration

The 2400 edits, batch combines, range tests, validates, error lists, corrects and blocks output cluster tapes.

You're looking at Mohawk Data's SYSTEM 2400 in its data editor configuration. This system will take raw keyboard data and rearrange, reformat, perform any kind of validity checking, range testing, sequence checking, and conditional value checking.

It will pool or merge data from various keyboards, or from different media. It will produce one edited reel of tape ready for processing. And it will do this for a rental as low as $600—in other words, you get full editing capabilities for a fraction of your current per keyboard cost.

The SYSTEM 2400 can perform concurrent I/O operations, and can be equipped with up to 32K bytes. Because it's modular, you can rent it in the forms we show here, or you can configure something special for your special work. To make the SYSTEM 2400 we created a new language. MDL (Mohawk Data Language) can be learned by anyone in the world in three days. Anyone.

The SYSTEM 2400 can satisfy all your utility needs off-line, freeing your main frame for bigger things. And, with prices ranging from $600, it can free up your EDP budget, too.

Truly, peripherals have come of age. Mohawk Data 2400.

Data-Satellite Configuration

Data-Printer Configuration

Data-Communicator Configuration

Data-Converter Configuration

Data-Sorter/Collator Configuration

Mohawk Data Sciences Corp.
Herkimer, New York

MDS

County Knows How to Save

CW West Coast Bureau

TUCSON, Ariz. – Rapid processing of tax receipts and mortgage company and title company impoundments by the Pima County treasurer's office is expected to accrue additional revenue of $500,000/yr. The office has netted $321,984 to date, with a possibility of $300,000 in increased interest benefits for the county's special subdivisions.

The treasurer's office has four IBM 2740 communication terminals, and one in the county data center. The terminals are on-line to a 360/40 with 128K of memory.

Although each tax receipt is processed individually, it is now posted in 15 seconds rather than three weeks, under the former manual system. The office then can invest the funds, which start earning interest, or promptly distribute needed funds to the county's subdivisions such as school and improvement districts.

Unemployed Should Change Job Field and Not Image

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – Job-hunting programmers who have had face lifts and bought wigs for a more youthful image are on the wrong track.

According to Dr. William Coleman, a new image is not the answer. Coleman is president of Coleman and Associates, and has long been identified with professional development and placement in the computer industry.

Coleman pointed out that EAM people who learned data processing the hard way and do not have degrees are in bad trouble. But image is not their problem. He asserted, rather, that the unemployment problem "is simply one of where we can use this talent when there are just not the jobs to absorb them."

Instead of an age problem, Coleman said there is a salary problem. Programmers who used to earn $20,000 are fighting for $12,000 jobs, and even though they would be happy to take the pay cut, employers fear that when the job market opens up again they will move to greener pastures.

Coleman also said that the third wave of layoffs is hitting the industry.

Ironically, the first wave hit the least capable people who were able to pick up what jobs were open. "Now," Coleman said, "it's the good guys who are being hit, and the jobs they should be able to get are held by less desirable people."

One of Coleman's solutions to the problem is movement to another job field. A person with management experience "is already technically obsolete, since he has been doing administrative work and has not programmed for a few years. He's going to have a hard time getting back.

"But in this country we have drained off the best brains for engineering and computing. Other fields are short of good people."

Retailing is one of these fields, Coleman said. "It's low pay but needful. They are lacking people competent in managing, and some of them have training programs."

Coleman also suggested work for the government. "Instead of being government contractors, some people are getting directly on the government payroll," he said.

Western Europe has been a good market for jobs, Coleman noted, but it is cooling down now.

Coleman warned against so-called career development companies, which promise they will find a job for a $500 to $1,000 fee. "They are milking and bilking people," he claimed.

Fingerprinting May Be Included In Data Banks

LINCOLN, Neb. – Fingerprint identification may become as common as names or license numbers in crime data banks, according to some crime experts.

Capt. Del Whitefoot of the State Police said systems such as the FBI's national crime unit and the soon-to-be-implemented state service keep the criminal "on the run."

Whitefoot said the FBI was working on a classification system for fingerprints, with the hope of giving the "foolproof" identifier capabilities similar to names or numerical labels, such as license, registration or social security numbers.

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British Convict 2 in Accounts Fraud

CW European Bureau

LONDON – Britain's first fraud case involving the doctoring of a computerized accounting system has resulted in jail convictions for an accounts clerk and a small grocery store owner.

Over the past three years, the system, dealing with thousands of accounts each week, paid out over $50,000 for goods that had never been supplied. The checks were sent to a small grocery store just outside the center of London.

The idea was dreamed up by Masood Ansari, an accounts clerk at Forte's (Holdings) Ltd., a large British catering organization, who fed into the computer a bogus account number for Fountain Stores, the small grocery store owned by his friend Shaukat Quraishi.

Both men were convicted of conspiring to cheat and defraud Forte's Ltd. They were also found guilty of other offenses of obtaining money from Forte's by false pretenses and dishonestly making use of a false invoice.

The charges were only samples of a total of 98 offenses perpetrated against the company in a three-year period, the prosecuting counsel charged.

Ansari was sentenced to four years in jail and Quraishi 21 months. The case was tried at Old Bailey Central Criminal Court.

The two men had confessed to getting nearly $120,000 in eight years from Forte's by fraud. Most of the money had gone to Ansari but it seems to have disappeared.

The judge said Quraishi was a poor man who was running a failing business and he had been landed in the dock by the influence of Ansari. Quraishi had received only about 10% of the money. Judge Christmas Humphreys said it was "amusing" that Quraishi had even paid income tax on his criminal gains.

Ansari persuaded Quarishi to make out false invoices for foodstuffs which included lobsters, scampi, salmon and trout in enormous quantities. The invoices were then secretly inserted into Forte's accounting system by Ansari who issued a false account number for Fountain Stores and fed it into the computer. Invoices were regularly submitted and the computer issued checks for up to $1,440, payable to Fountain Stores.

It was only by chance that the fraud was discovered last year when another accounts clerk was looking through hundreds of invoices and code numbers and he noticed an unfamiliar code. His query started an investigation leading to the arrest of Ansari and Quraishi.

UK's Ernie Due For Replacement

CW European Bureau

LONDON – Ernie, faithful servant of the British gambling public for 14 years, will be pensioned off, and replaced with a newer system able to perform in four hours the functions that currently take nine days.

Ernie (electronic random number indicating equipment) is used to generate prize-winning numbers for premium bonds, a national savings scheme.

The replacement system, which will also been known as Ernie, is being designed and built by Plessey using modern electronic techniques and incorporating a process control computer.

Viatron's Legacy

User Discovered Cheap, 'Intelligent' Data Acquisition

A CW Staff Roundup

No matter what the future has in store for financially beleaguered Viatron, the users of its System 21 have achieved the promised reduction in data acquisition errors, higher quality work and cost savings.

The concept of an inexpensive "intelligent" data acquisition terminal, moreover, remains as an example for the seekers of cheap but accurate data entry.

Now that Viatron has a customer base, other companies have shown interest in simplified distributive data processing, bringing cheap computer power to the input source.

Early Viatron customers are convinced they have taken the right step in buying (or leasing) these terminals.

The principle of cheap, accurate data acquisition is called the "gorillical approach" by one user, who offered the following observation: "putting the monkey on the back" at the "root of the problem" means "capturing computer input data at the source."

This language belongs to Aldrich Chemical Co. of Milwaukee, which bought two System 21s, evaluated them, then bought three more, despite Viatron's switch from rental to purchase-only policy.

Aldrich's DP manager, M.G. Koehler, explained the company's gorillical theory of evolution:

Input historically required "recording of information onto forms designed to facilitate the keypunching function," or the recording of raw data by "input editors," the interpreting and punching of this data by keypunchers, "occasional verification of the card that resulted and, finally, entry of cards into the computer system."

Koehler believes that by utilizing System 21, "we have contravened this historical approach and have, instead, come up with what I call the 'gorillical' approach . . . capturing computer input data at the source."

Placing the input responsibility at the source has resulted in a lower error rate, Koehler claimed, since this procedure eliminates both interpreting and punching errors, leaving only written recording as an error source.

Cut Phone Billing Woes

This original stage, handwriting original documents, has also been implemented on Viatron terminals by one of the largest, earliest users of System 21, New England Telephone Co.

The utility has about 75 terminals installed in eight of its nine accounting offices in New England, and "more are still being delivered," a source told CW.

The terminals are being used mostly to take the place of handwriting complex service orders. Use of the terminals results in a high degree of accuracy, a user reported, with consequent cost savings for the utility and ultimately for the customers.

The savings are first seen by eliminating some keypunching in bulk jobs, since the original document becomes computer-formatted as soon as it is visually verified. The error correction capability is a great asset over writing multiple copies, the source noted.

In the telephone company's arrangement with Viatron, the manufacturer maintains the Boston terminals, and CDC performs this service for peripheral offices, which are located more than 50 miles away in locations like Springfield, Mass., and Salem and Manchester, N.H.

Small-Business Users, Too

Another New England user of System 21 started his "small business" in Reeds Ferry, N.H.

Carl Findley is not your run-of-the-mill small businessman; he is one of the few blacks in the area and, as such, he said it was not too difficult to get a Small Business Administration loan of $25,000 to set up Compro, his own service bureau.

As an engineer, he worked for Sanders and CDC before breaking off on his own.

Like other users of System 21, Findley is extremely conscious of data acquisition problems. He said other service bureaus don't consider the process, "they just take it for granted." A customer either has to send these bureaus original documents "or have a noisy keypunch in your office," Findley observed.

He believes he has soived the problem of input, while making it easier and cheaper, by having the customers perform that part of the computer process: he is putting Viatron terminals in his customer's offices.

The data on "Viatapes" is converted at Compro to IBM 360 readable tape, and then processed on a 360/30 nearby. Compro's business is split about equally between accounting and billing applications and production control, according to Findley.

Sound Proposition

Findlay stressed that the administration thoroughly checked out the soundness of his business proposition before making the ioan.

But he has had some difficulty building his customer buse.

Natural isolation from the white community, where much of the business is performed, magnified the problem.

But, once the original contacts were made, the color was neither help nor hindrance.

So, from the giant utility to the small service bureau, and including a medium-size operation, these users appear to have in common the need for the inexpensive but intelligent data entry that Viatron has educated them to expect.

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MEMOREX

Random Notes

Users in California Rent Part of 360/67

WALTHAM, Mass. – Members of a user group in the San Francisco area will be able to rent time on an IBM 360/67 for a flat rate per month, under a plan devised by Interactive Data Corp. and Wellsco Data Corp., of San Francisco. The flat rate plan will cut costs "substantially" below either an in-house system or a commercial service bureau, IDC said.

Membership in the user group is available for annual or semiannual periods. For a limited time, however, one-month trial memberships are available, IDC said, from 486 Totten Pond Road.

Macs Library Package Maintains Source Programs, JCL Streams

PHILADELPHIA – IBM DOS/360 users can store, maintain, compile and test source programs on tape or disk, with the Program Update Librarian (Pulmacs) package from Management and Computer Services Inc.

The system catalogs, renames, replaces or deletes complete units or portions of programs. DOS job streams can also be cataloged with Pulmacs, the company said.

Source statements are automatically resequenced each time a program is altered. Pulmacs keeps a summary record of changes made during three prior updates. The package is available for $995, including maintenance for a year, 1040 Park Towne Place East.

Users Rent Mag Tape to Meet Long-Term or Temporary Needs

ELMSFORD, N.Y. – Users can meet fluctuating needs for magnetic tapes through a tape rental service from Time Broker Inc. Both short and long term needs can be met, the company said, and a purchase-lease back plan is available. All plans include maintenance and provide for replacement of defective tapes.

Libraries can be upgraded from 800 to 1,600 bit/in. during the rental period. Tapes cost $2/mo per 2,400-ft reel, from 500 Executive Blvd.

Compu-Time Net to Help Banks

DAYTONA BEACH, Fla. – Compu-Time has developed a series of programs to provide a time-shared management information service for small banks in the southeastern states.

Paper tape punched by accounting machines as a byproduct of posting to ledger cards serves as input to the system through a terminal. The programs provide daily profit statements, an analysis of the bank's time and demand loans, and a report on delinquent loans. Compu-Time is at 327 Orange Ave.

'Tims' Handles Record Forms

CAMBRIDGE, Mass. – The Telcomp Information Management System (Tims) is a new program on the Telcomp time-sharing network. An interactive language, Tims creates, updates and retrieves data records of any format.

A Tims user can use fixed or variable length records so he can design a file particularly suited to an application. In searching the file, the user may specify the need for exact matches or more general parameters. Telcomp Corp. is at 50 Moulton St.

IBM Explains Limits

Licensed Programs Can Be Modified

By Don Leavitt
CW Staff Writer

WHITE PLAINS, N.Y. – Users who have IBM program products under license agreement are not necessarily locked into using the package as is. The licensing concept, which came into effect with unbundling, is intended to protect IBM's interests, the company said, rather than restrict the user's right to modify the package if he wishes to do so.

Software users can modify any IBM program products, but they are responsible for the changes. IBM will bill the user at hourly rates for any system engineering effort needed to debug modifications.

The IBM licensing agreement imposes limits on what the user may copy or change, but the restrictions do not distinguish between coding that the user develops himself and coding acquired as part of a software package from an independent developer. Users are free to combine "enhancement" packages with the original IBM programs to try to get better, or different results, IBM said.

Operating systems and other programming support packages are not covered by the normal licensing agreement, but IBM told CW that users may also alter these program products if they wish.

Even if a user changes a portion of an operating system, IBM said that it would continue to provide programming support to the unchanged portions. Only the modified sections would be subject to the hourly charge if debugging help is needed, IBM said.

IBM set up three classifications for its program products at the time of unbundling: classification A provides free centralized program service, including distribution of updates, and free engineering on-site for problems traceable to IBM coding.

Classification B continues the centralized program service but shifts field engineering to a billable basis. No central support is provided under the C classification, and field engineering is billable.

Once the user makes changes, programming support for the entire package is not automatic but is determined by whether IBM or user-supplied coding caused the problem.

The licensing agreement is very specific in allowing the user to modify any licensed program "for his own use." He is allowed to use the updated program on the CPU designated in the agreement, or on another when required by CPU malfunction.

If the user makes an authorized modification under the terms of the agreement, he must include the internal IBM copyright notice in machine-readable form on his updated work.

The licensing agreement contains the usual copyright prohibition against copying "in whole or in part" any materials provided in printed form by IBM.

Users are allowed, however, to copy materials provided in machine-readable form. Such copies may be in either printed or machine-readable form, and may be used, according to the agreement, "for archive or emergency restart purposes, to replace a worn copy, to understand, or to modify the licensed program."

Users have found that by modifying a copy of a program and leaving the original intact, they can usually determine whether a problem is being caused by the IBM coding or by the changes.

The rights of the user, as well as instructions on how to create the required copyright notice on modified packages, are spelled out in a pocket-sized booklet entitled "Instructions on Copyright Notice," IBM form G120-2083, available through local branches.

Hardware Simulation Packages May Cut Use of Benchmarking

Users considering new hardware may someday be able to simulate workloads of proposed configurations and avoid time-consuming benchmark procedures. But currently available simulation techniques apparently are not yet up to the job.

The current packages, including Case from Computer Learning and Systems Corp. and Scert from Comress, can and have been used effectively in simulating many workloads and many configurations, but their limitations prevent them from being used heavily for final equipment decisions.

One major drawback to simulated benchmarks is more related to a scarcity of operating parameters rather than software. It is often impossible to simulate the operation of a newly announced system when details about throughput and operating times are unavailable.

Sometimes, too, the simulator packages may not allow for a vital element of a hardware system even though it is not new. Scons, for example, has been criticized for not being able to cope with the dynamic allocation of core that is a crucial part of Burroughs Master Control Program for the B500 family of computers.

But users are enthusiastic about the ability of the simulators to evaluate conventionally organized systems for which the characteristics are well known. With this capability, users have been able to study various reconfigurations and expansions of their current equipment.

Simulators are sometimes very good, Spokesman at the Air Force simulation lab at Rancon Field report that simulated and actual benchmark results were, in one case, only five minutes apart on a two and a half hour business run. In another example, the simulated and benchmark tests were only two minutes apart, on a two hour processing run, spokesman said.

But other results were far less accurate. A scientifically oriented test ran 55% to 255% off the times anticipated by the simulations. Another project took just under six hours, rather than more than six and a half hours as forecasted.

He said that the Air Force had considered the possibility of using simulations instead of benchmarks for final hardware choices, but had to drop this plan since it could not run good simulations for all configurations. The Air Force was unwilling to make decisions based partly on simulations and partly on benchmarks.

As effective as the packages appear to be, one industry source has warned that learning how to use them might well cost more time than a user could reasonably justify. He foresees the development of consulting organizations or simulation service bureaus dedicated to hardware simulation to provide the user with the required capabilities.

Features Improved, Cost Doubled With Second Version of IMS/360

WHITE PLAINS, N.Y. – OS/360 users can have expanded capabilities in data base and data communications support with the new Version 2 of IBM's Information Management System (IMS) program product. But the full upgrading will nearly double the monthly cost, compared to the earlier IMS.

Both Version 1 and Version 2 operate under OS/360 on IBM 360 and 370 equipment and provide data base access methods, along with recovery and checkpoint options. Data communications support is also a part of both versions as is the ability to interface with application programs written in Cobol, Assembler or PL/1.

The two versions have centralized program support, with automatic distribution of corrections. Users of Version 1, which has a "B" classification, pay for any field engineering help they need. Users of the new version, which has an "A" classification, get that support free.

Data base support under Version 2 has been expanded to include two new methods for direct access and indexed direct access to hierarchical data structures. Improved space utilization permits blocked overflow areas and reuse of space that becomes available when a record is deleted from a direct access device.

Concurrent updating of a data base by multiple users with exclusive control at the segment level is available.

Data base only Version 2 is now available for $550/mo under license agreement. The combined system is licensed at $1,175/mo. IMS Version 1 is available for $600/mo.

One-Day Tape Retention Cycle Urged

NEW YORK – Users of IBM 360 OS/MVT can protect data sets against being inadvertently overwritten the day they are created by always specifying a retention period of at least one day.

The Bug-of-the-Month" column in the February issue of *Thruput*, published by the Association of Computer Programmers and Analysts, urges this approach to safeguard files.

It describes a user of a newly generated version of OS who failed to unload a data file or print a KEEP message on the console.

The tape file had no specified retention period and the next job after label checking assumed the reel held nothing. The error was not discovered until several days later.

Modifying the JCL label card to show LABEL=RETPD=1 would have guarded against the tape being overwritten the day it was created, the author said.

Acpa is at 2 Pennsylvania Plaza.

Math Strong Point, But...

APL Commercial Processing Gaining

By Don Leavitt
CW Staff Writer

IBM's APL time-sharing language was originally conceived for mathematical operations, but many users are discovering that it has general business capabilities as well.

The heavy-mathematical time-shared bias of the "APL nuts" very nearly stopped one now-happy user.

If that user is convinced that APL is the way of the future for business programming, another is just as definitive in calling APL a new branch of mathematics, comparable to the development of algebra.

One of the major advantages of the APL system, as far as the mathematicians are concerned, appears to be its self-contained nature. There are no I/O considerations, in the conventional sense, with APL. Everything, program logic and data, is contained in user-defined "workspaces," normally 32K bytes in size.

But if this "machine-independence" is favored by the theoreticians, it is likewise an element of APL that requires the most rethinking of program logic on the part of the business-oriented user. Program logic and intermediate results from one workspace cannot be carried over to another, and large files on tape or disk are simply not available.

Another limitation of APL is that implementations are available only on IBM equipment. Various university computer centers have developed APL for CDC and for XDS configurations, but these have not yet been supplied to users.

It is also understood that the DEC PDP-10 has been used for a version of APL, although this development, too, is incomplete. Among the mainframe manufacturers, Burroughs apparently is studying the possibilities of the language, but the company would neither confirm nor deny such an effort.

One time-sharing network has developed a series of business-oriented applications based on APL.

Users of other APL time-sharing services have reported development of inventory control systems, process control evaluation and transmission of results to the concerned technicians, and financial modeling for real estate operations.

APL does use a very rich character set. It has instructions that are similar in power to macros in Assembler Language. And in APL these can be rephrased and extended to suit the user's needs. This ability to extend the commands has brought criticism from a number of people.

The extensions can become so complex, the argument goes, that it becomes very difficult to follow program logic.

Classes Planned By N.J. Service

CHERRY HILL, N.J. — Schools and colleges can have complete scheduling of students done for them by the Computer Dynamics Corp. The service produces individual student schedules and auxiliary reports.

The user provides student requests, master schedule and special rosters. The cost is $1.65/student for schools with 1,000 to 2,000 students. Rates are lower for larger schools and slightly higher for smaller institutions, from 401 Cooper Landing Road.

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CW

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Bits and Pieces

DEC Writing Tablet Uses Spark Gap Pen

MAYNARD, Mass. – A writing tablet for digitizing graphic data, offered by DEC for use with the PDP-8, PDP-12 and PDP-15, is activated with a stylus or ball point pen with a spark gap. The spark gives off a sound that is picked up by microphones at the side of the tablet.

The 11 in. by 11 in. VW01 stylus can transmit data either point by point or continuously to the computer. The tablet is priced at $4,500 and will be available in April.

Also for the PDP-15 is an Interface, the CA15A, that enables the computer to control more than 150 physics instruments and conforms to industry standards. The device can operate in program interrupt, automatic priority interrupt or data channel modes, and is priced at $9,950.

Plotter for Time-Share Users Includes Software Routines

WEST LONG BRANCH, N.J. – An incremental plotter from Electronic Associates, Inc. is specifically designed for time-share users. The 230 digital plotter is a self-contained, desktop unit, interfaced to keyboard terminals and acoustic couplers. It includes Fortran subroutines and operates at 110 and 300 bit/sec.

The 230 is said to plot graphics an average of five times faster than other comparably priced units. It is priced at $6,250.

Magnetic Stripe Credit Cards To Be Read by IBM Terminal

WHITE PLAINS, N.Y. – A small terminal that reads electronically coded credit cards has been developed by IBM. The 2730 Transaction Validation Terminal, attached to a telephone by a new type of acoustic coupler, will be used at point of sale to clear credit card charges.

About the size of a portable typewriter, the 2730 is IBM's first product to use the magnetic stripe credit card. Up to 40 characters identifying the cardholder are encoded on a thin magnetic stripe. To use the 2730, the computer must be equipped with IBM's 7770 audio response unit, and a 2988 receiver-transmission control unit. The 2730 will cost $515 for delivery in the second quarter of 1972.

Head-per-Track Fastrack II Reduces Data Access Times

FORT LAUDERDALE, Fla. – A high-speed head-per-track disk memory system that sharply reduces data access times for the SEL 81013 mini is available from the Systems Peripheral Division of Systems Engineering Laboratories (SEL).

An upgraded version of an earlier system, Fastrack II has an average access times for the SEL 8108 mini is transfer rate of 4.5 million bit/sec. Prices for Fastrack II models range from $19,300 to $112,500. Lease terms are also available from 8901 West Sunrise Blvd.

ESP Counters Power Loss

PLAINVIEW, N.Y. – Electronic Standby Power, a self-contained unit from Epsilon Sigma Pi, Inc., automatically supplies up to 1,200 watts.

The unit senses the absence of line power and turns itself on. Epsilon Sigma Pi, Inc. is at 37 South Mall.

Captures Screen Data

Hard-Copy Can Increase CRT Flexibility

By Frank Plasts
CW Staff Writer

The development of devices that can make hard copies from CRT screen displays is helping to eliminate a major drawback to these terminals.

The ability to preserve permanently the transient information appearing on the screen, allows the user to capture the facts for later reference.

With the availability of a half dozen or so devices the user can now choose the one which suits his needs best.

The copy units range from a very simple adapter that uses a standard Polaroid camera to take pictures of the screen, to a very elaborate $20,000 unit by Corning Glass Works that has a xerographic copier incorporated into its design.

Most hard-copy units, however, use the same impulses that activate the CRT to produce an image on a piece of paper. The output of these units varies in size of copy, speed of the copying process, quality of reproduction, and cost per copy.

The applications for which the hard-copy is to be used will determine the size of copy required. If massive files are involved and a great deal of data is displayed on the screen, a page size as large as that of a sheet of computer printout may be needed.

Most users will probably find the standard 8-1/2-in. by 11-in. sheet to be the most practical, because of the ease of storage and handling. This size copy is sufficiently large to reproduce clearly all but the highest density screen contents.

Units like the Corning 904 and the $3,750 Tektronix 4601 can handle oversize, as well as standard-size copies.

The other extreme, small memo-sized sheets such as those produced by the $9,950 Photophysics CRT Terminal, have been proposed as a method of informing airline customers of flight arrivals and departures.

Because this type of data is transient, being continually updated, the copies are not usually filed and their non-standard size is not a disadvantage.

The density of data can also have a bearing on the readability of the copies. Complex graphics would be more critical to reproduce than simple numbers.

Pennies per Sheet

Another factor tied to the application is the cost. A Polaroid photo taken with a $300 device may be the least costly method if few copies are needed, whereas the hard copy device could be the more economical if copies were to be widely and frequently distributed.

The best performing devices currently available can turn out a copy every two seconds at a cost of one to two cents each.

Also important is speed. Obviously, the faster the device, the more expensive it is.

It should be noted that the hard-copy mechanism is not the only way to secure permanent record of the contents of a CRT screen. At least one terminal (Datapoint 3300) is offered with an on-line printer that can be shared among up to five terminals. The principle of operation is somewhat different from hard copy devices, in that the printer is started and stopped by a data character and it operates in parallel with the screen. In this case the decision to capture data must be made before it is seen. The unit is a thermal printer and is said to be quieter than an office typewriter.

The chief advantage in the CRT-based systems lies in their adaptability to environments that are noise-sensitive. There is also a status symbol to the CRT that makes it appeal to some users.

According to one large time-sharing organization, some customers have asked for the CRT terminals, but the spokesman said that the device was not suitable for most users.

The biggest growth of the CRT terminal, and the associated hard-copy devices, will be in specialized areas dealing with a unit record approach to inquiry processing such as credit card information requests, according to one observer.

Low-Cost Video/Graphic Terminal Displays X,Y Vectors, Characters

NORTH BRUNSWICK, N.J. – Princeton Electronic Products has incorporated its PEP-400 Video/Graphic Storage Terminal into the PEP-801 interactive CRT display that displays vectors and alphanumerics and operates either on-line or over telephone lines.

The low-cost device features high-density displays on a TV raster readout that allows multiple monitor displays at minimal additional cost. The unit includes a high brightness, non-store cursor readout and an electronic zoom feature available at the terminal.

In addition to operating as a remote terminal at 2,400 bit/sec, the 801 can be modified to run at speeds compatible with on-line computer operation. Several systems have been developed, the company said, to interface the device with such full-scale systems as the IBM 360, as well as with such minis as the Data General Supernova.

Characters on the CRT are formed in a 5 by 7 dot matrix at a speed of 50 usec/char. All characters are drawn during CRT retrace time in order to eliminate flicker. Characters are both upper and lower case and the screen capacity is a 4,000 character display (80 by 50).

Vectors can be drawn using an incremental technique with each vector word containing X and Y information. Vector words are made up of four 8-bit words.

Input to the device can be either serial or parallel. Serial inputs can be either Teletype-compatible at 110 bit/sec, or modem-compatible at speeds of 110, 1,200, and 2,400 bit/sec.

The PEP-801 is priced at $6,500. Initial shipments are scheduled for October, 1971.

The company can be contacted through P.O. Box 101.

Computer Performance Analyzer Uncovers Inefficient Hardware/Software Systems

CHERRY HILL, N.J. – The latest product offered to help the user determine if his equipment is being used efficiently is the CPA 7800 performance monitor from Computer and Programming Analysis, Inc.

According to the company, users of the device are able to monitor and analyze the operation of hardware and software components, resulting in significant cost reductions.

The 7800 measures the efficiency of a system by means of up to 128 probes that are attached to points on the computer's CPU, I/O channel, device controller, or to a peripheral device by a field engineer. These probes reflect whether an operation is going on within the device. Operations which can be measured include whether the system is waiting for work, whether the CPU is busy, whether an action is going on in one of the channels, and others.

As pertains to a disk file, a probe in the circuitry which receives a pulse when a Seek operation is started, and another which detects the end of the Seek, would be able to measure the time for the seek by measuring the time between pulses.

An address comparator feature can be used to monitor the amount of time that it took to execute a particular routine or set of routines in memory. This technique could be used, for example, to calculate how much time is spent in the execution of operating system instructions.

Data picked up by the probes is accumulated in buffered registers and recorded on a self-contained magnetic tape unit.

The output of the magnetic tape unit is processed by a system of software called the Performance Diagnosis System. This group of Fortran IV routines is modular in construction permitting the user to change or expand upon reporting formats and retrieval functions provided with the basic software, the company said.

The cost of the CPA 7800 system is $21,500, with additional 7816 analyzers priced at $14,950. Rental and pay-out lease plans are also available. First deliveries are scheduled for April from 1 Wynnewood Road.

'Point Box' Speeds Up PDP-8

ANN ARBOR, Mich. – A hardware floating point unit for the DEC PDP-8 mini, the Hardware Floating Point Box developed by Software Engineering, does 36-bit arithmetic in a format used by the software routines under DEC 8K Fortran, but 60 times faster, the firm claimed.

The range of floating point values is $\pm 10^{38}$ with a resolution of eight decimal digits, the company said. The unit is IOT driven with computations taking between 10 and 50 μsec.

The unit requires only a small amount of software support and interfaces to the programmed transfer I/O bus of any PDP-8, the company said. It can also be adapted to any DEC 18-bit mini.

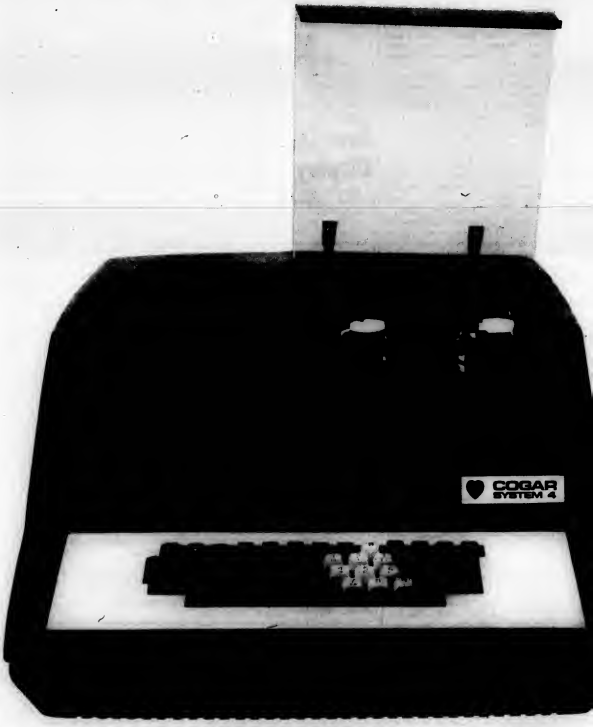
The unit runs independently of the computer program and the running time of the unit is overlapped with program operations.

For sequential CALL instructions, the speed of operation is limited by the computer, the company added.

The price, including operational logic unit, power supply, cables up to ten feet, and manuals, is $6,600, not including installation. Options at $800 each include negative programmed I/O bus conversion and triple integer arithmetic operations.

Software Engineering is at 117 N. First St.

Anatomy



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Ampex Core a 'Significant Improvement' Over IBM

By Frank Pisata
CW Staff Writer

Users of Ampex ECM extended core memory think that the device offers a significant improvement over the IBM 2361 LCS memory that it replaces.

CW spoke to about 15% of current users and most are happy with all aspects of the memory, from performance and throughput to installation and maintenance.

The ECM is being used for a variety of purposes. One installation is using the bulk core as a zero-access disk for the storage of operating system software. Located in a large university computing center, the ECM connects with a 360/65 used for general data processing as well as some 1,500 student programs per day. The system also serves as the university's principal research machine, with 40 terminals supported.

The 2 Mbyte capacity of the ECM is not completely utilized, but the advantages gained through interleaving outweigh the cost, a spokesman said.

The installation of the memory proceeded smoothly and maintenance problems were not significant and remedied rapidly, he noted.

The performance of the ECM memory is at least as good as promised by Ampex, with a cycle time that is at least as fast as the rated speed, one user said.

User Reaction

Satisfaction with performance was typical of the feelings expressed by the other users. One large time-sharing firm uses the ECM attached on a 360/50 which provides 60 user ports. The large-scale memory is used primarily as a swap area for the 14 2314 disk drives attached to the system.

The same installation originally had considered the IBM 2361 as an alternative, but found that disk overrun would be a problem. This did not happen with the ECM, he said.

One user fear that did not materialize was a degradation of compile speeds. This had been expected, a user said, due to the location of Link-Pack areas in the extended core. The memory was easily installed, he said, and maintenance has been excellent.

Maintenance Good

The availability of maintenance is important. One user in rural Idaho said he considered his support remarkable while a city user said he had reservations about the quality of service on his 1 Mbyte ECM unit.

The city user said minor problems had been encountered during installation, but nothing was unusual. Since that time the maintenance has been excellent, he said

One installation uses its ECM with a 360/50 as work areas for processing. A second 360/50, equipped with 1 Mbyte of IBM LSC does similar chores. On a side-by-side comparison, this user said the Ampex unit was about 80% faster and significantly more reliable.

One user with long ECM experience told CW his memory has been installed for a year and a half. He too was generally satisfied with Ampex installation and maintenance, but admitted that some service was not up to that offered by other independents.

The primary use of one user's ECM is to provide work areas for user-inquiry programs on a 360/50-based teleprocessing network. Speeds, this user said, were significantly faster than those of the 2361.

With only one exception the users told CW they would be interested in more Ampex equipment. The one dissident said that the 2-year lease terms were too long.

Lower Cost Model 5 Extends Datacraft's Line of 6024 Minis

FT. LAUDERDALE, Fla. – A third, lower-cost model, the 6024/5, has been added by Datacraft Corp. to its 6024 real-time and industrial automation minicomputers.

Based on the 6024/1 and 6024/3, the new model has a slower cycle time of 1.3 μsec/word and is limited to a maximum size of 32K. The earlier 6024/3 has a cycle time of 1 μsec and can handle up to 64K.

The 24-bit machine is completely hardware and software compatible with the two prior models. All peripherals, such as disks, tape line printers, card and paper tape reading and punching equipment, as well as Teletypes, can be used.

Software available includes a resident and disk-resident operating system. The user can program in Fortran IV, Assembler and a desk calculator language, Conversational Algebraic Language.

The basic system is equipped with 4K memory, expandable in 4K word increments and has five programmable, general purpose registers, three of which are index registers.

The instruction set numbers 582 with typical timings of: add/subtract, 2.4 μsec; multiply, 9.6 μsec; divide, 18 μsec; and square root, 16.8 μsec.

External interrupts are provided at 2-16 true levels, and up to four executive traps are implemented.

The basic 6024/5 can be equipped with up to 14 channels, either programmed or automatic, and as many as 16 devices or device controllers can be attached.

The price of the basic system is $15,500 including software. First shipments will begin in September.

The company can be contacted through P.O. Box 23550.

Hytek Terminal Forwards Branch Accounting Data

BELLEVUE, Wash. – A data entry terminal for small businesses, the Hytek Technology, Inc. Model 420, is designed for forwarding accounting information from branch to central offices.

The system features a 10-key adding machine with journal tape hard copy output. A 14-character telephone dialer card reader is included, and a speaker with volume control adapts the unit to audio-response applications.

Either an acoustic coupler or an internal modem for connection to a Bell DAA is provided, and the user has a choice of either parallel Touch-Tone or serial Ascii transmission.

The Hytek 420 is priced at $720 and is available on a 90-day delivery from Northrup Park.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Switchover Set

DAA Allows TWX, Data Use of Terminals

By the CW Technical Staff

NEW YORK — When Western Union takes control of AT&T's Teletypewriter Exchange Service (TWX) network on April 1, data users will get some benefits.

As part of the complex sale agreement, Western Union will provide a Bell-type Data Access Arrangement (DAA) device to allow non-carrier teletypewriters to be used on the TWX network.

The TWX DAA now in development will be a Bell type CBT with a modified timing interval, according to an industry observer. It will lease for about $13/mo, he estimated.

With the unit, a user will be able to interconnect non-Teletype Corp. teleprinters using them at low speeds for the printer transmission and at high speeds for data handling.

As a byproduct of the TWX sale, AT&T will not provide low-speed terminals for its dial-up users on the Bell switched network for five years. Terminals will be available from Teletype Corp. and Western Union Data Services Co.

Under the WU operation, two firms will be serving subscribers. Western Union Telegraph Co., a regulated carrier, will handle line facilities, billing and DAA devices; Western Union Data Services, a non-regulated subsidiary, will provide equipment and maintenance.

The exact relationship between the carrier and WU Data Services is not clear. Under the FCC's tentative decision in the computer inquiry, data processing services can be supplied only by completely separate subsidiaries of common carriers.

Apparently the FCC is studying the situation. Recently the commission asked WU to clarify "the business relationships that exist between the Western Union Telegraph Co. and each of the affiliated companies of the Western Union Corp. system."

Although Western Union TWX will not differ from Bell's, maintenance may be a problem. WU is staffing up to handle service calls but Bell apparently will continue to offer back-up maintenance until early next year.

Communications

Since WU will be operating both TWX and Telex message services, interconnection of both networks may be facilitated. At present Telex subscribers can reach TWX sites but traffic the other way is not yet possible.

By next January TWX subscribers will be able to reach Telex sites through the WU Telex Computer Communications Service (TCCS). Communication between the two networks poses a problem because of differing transmission speeds.

Data to Fly on Comsat Satellite

CW Washington Bureau

WASHINGTON, D.C. — Communications Satellite Corp. has proposed a multipurpose domestic satellite system to provide a wide range of communication services — including telephone and data services to customers throughout the U.S.

In its new filing, separate from its joint plan with AT&T, Comsat said the proposed system would use three high-capacity satellites in synchronous orbits and an initial nationwide network of 132 earth stations. The system could ultimately cost $248 million.

The Comsat and AT&T application is expected to be revised by the two companies and a number of similar filings is expected from other firms prior to the new deadline. RCA, Fairchild Hiller, Lockheed Aircraft Corp., Microwave Communications of America and Western Tele-Communications Inc. are expected to submit proposals.

$1,000/mo Saving Seen Possible

Few Users Taking Advantage of Shared Data Lines

By the CW Technical Staff

Shared data lines promise increased efficiency and decreased costs for many communications users. Unfortunately most of the promises are still unfulfilled.

Although recent tariff changes and service offerings apparently favor the sharing of lines by data users few shared lines are now in operation.

The problems for the user seem to be threefold. First he has to find enough data users transmitting information over the same route to justify forming a group. Next he has to acquire the necessary line facilities from the Bell System. And finally, depending on how he plans his group, he could be classified as a common carrier and requested to file a tariff by the FCC.

Are all these problems worth the possible savings in cost? Apparently so. A spokesman for a company planning to share its lines told CW that a typical savings of $1,000/mo for a line between New York and Los Angeles is realistic.

He added that sharing is being actively considered by larger knowledgeable data users. Although the savings in shared lines are greatest over long distances, small

Communications

short haul users apparently can also benefit, he added.

One firm that has been actually operating shared data lines since last year is International Management Information Services Inc. (IMIS). The firm is said to have about 15 users on its lines which are available between New York and Los Angeles. In addition IMIS operates shared links to San Francisco and Hawaii.

Many of the firm's current subscribers are small data users who use shorter haul facilities, and some users operating on shared lines between San Francisco and Los Angeles are enjoying cost savings comparable to transcontinental users, the spokesman said.

Although some shared line groups are now in the planning stage, not all are successful. A recent attempt by a group of large data users in New York apparently fell through when a majority of the prospective members dropped out.

An industry observer told CW that fear of possible FCC regulation and possible strained relations with the Bell System may have contributed to the dissolution.

At present two types of firms are involved in planning shared data facilities. The first type is a user who needs only a portion of his available lines. Under recent changes to AT&T Tariff 260, such users can share their surplus line capacity with other data users.

Brokers

The second type of firm is described as a sharing broker. The broker apparently matches data subscribers who have surplus capacity with prospective users who wish to share lines and costs. The brokers will not lease or sell anything except their service, according to a spokesman.

Most sharing plans include the multiplexing of facilities to serve many users. The tie-in of line facilities with the use of multiplexors has led at least one firm into a new status with the FCC. The commission has recently stated that Timeplex Inc. should file tariffs to cover its operations.

The firm has not yet decided whether it will contest the proposed carrier status. Timeplex will soon provide shared lines to users between New York and Washington.

Sharing of capacities is the basic concept behind AT&T's experimental Series 11,000 offering which Bell has available in the Northeastern part of the country.

Series 11,000 service has been challenged by Microwave Communications Inc. (MCI). An MCI spokesman said that Series 11,000 was offered after AT&T had told the FCC that there was no need for such a service as MCI proposed.

The similarity is noteworthy, MCI said, since AT&T claims not to have done any market research for Series 11,000 service.

The experience of Series 11,000 potential users indicates that there is indeed such a market. One firm, Series 11,000 Inc., contracted to take one "super group" of 60 channels from New York to Chicago.

The company plans to use one channel for, its own communication, as required under the sharing tariff.

Series 11,000 Inc.'s currently quoted rate of $375/mo per pair of voice or alternate voice/data channels is said to be approximately one third the rate that Bell is charging for comparable private lines.

Two companies offering to act as brokers for shared communication line users are Communications Facilities Exchange, Ramsey, N.J., and Systems Architects Inc., Randolph, Mass.

In addition to Timeplex Inc., Washington, D.C., and Series 11,000 Inc., New York, firms that are organizing shared-use groups include International Management Information Systems, San Francisco; Fairfield Data Technology, Stamford, Conn.; and Scantlin Electronics, New York.

Carriers Would Bill DP Users in Canada

OTTAWA, Canada – Canadian time-sharing subscribers would have easy access to many networks and services, with the help of the communications common carriers, under a plan being considered by the government's Telecommission.

The carriers proposed the plan, in which they would perform a merchandizing and bill collecting role for independent data processing organizations. The carriers said they themselves would be barred from supplying either "raw computer power" or application services to the end users, under the proposal.

In effect the DP vendors and the carriers would work together if the plan is accepted by the government. Services of the vendors who "signed up," would be advertised by the carriers, and listed in directories available to the carrier subscribers. The telephone companies would also provide direct user assistance, as well as performing all system accounting and billing for the vendors.

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Big System Does Little Things

PRINCETON, N.J. – A computer and a graphic display system will help researchers in Princeton University's Chemistry and Biochemical Science departments make electronic "models" of molecules and other graphic applications in organic chemistry and molecular biology.

A DEC PDP-10 is linked to an LDS-1 visual display system from the Evans and Sutherland Computer Corp.

In the chemistry department, the system will be used to examine ways a computer can help an organic chemist design a chemical synthesis, elucidate a chemical structure, or design a chemical structure with specific properties.

In the Department of Biochemical Sciences, the system will be used to study interaction of large biological molecules such as DNA and other nucleic acids, proteins, and viruses.

Each day customer and collection data is recorded by means of an Addo-X adding machine attached to a batch recording system (foreground). After business hours, the Birmingham computer "calls up" the remote terminals and accepts recorded information.

Field Accounting System Gives Insurance Agents 'Free' Time

BIRMINGHAM, Ala. – Liberty National Life Insurance Co.'s remote, computerized insurance field accounting service is designed to relieve agents and clerks in the field of laborious, manual bookkeeping.

The new system ultimately will link 128 offices in seven states with a single computer here.

Under the old system, Liberty National agents collected both weekly and monthly premiums, accounted for the funds, kept their own records and turned the money into the district office. Each salesman spent two to four hours weekly in purely clerical duties.

Using the automated system, the agent still collects the funds. But he has only to turn them in, leaving the accounting and recordkeeping to the computer.

After telling the computer how he wants to collect his weekly accounts, the agent is furnished a weekly route listing of collections to be processed in the coming seven days.

As he collects the money, he lists on the route sheet the amounts collected.

Applications

At his convenience, he turns in the funds and route list to the office manager at the district office.

Each day the customer number and amounts collected are recorded with an adding machine attached to an IBM 1907 batch recording system at the district office. The data is recorded on magnetic tape stored in the terminal.

After business hours, the computer in Birmingham automatically "calls up" the terminal in the remote city.

Electronically, the terminal is turned on and relays the recorded data over the telephone line to the computer. This technique is repeated at each district office. Then the computer processes the data and prepares a wide variety of reports for use the following morning.

Developed on an IBM 360/50, the system initially will serve offices in Montevallo and Birmingham, Ala. When all district offices are in the network, a 370/155 will handle the traffic.

Florida Uses Network To Control, Budget Medicaid Expenses

JACKSONVILLE, Fla. – Using a statewide communications network built around two computers, the state is proving that the Medicaid health care program can serve a broad segment of the public effectively while staying within budget.

"With our advanced information processing system, we know the amount of Medicaid funds obligated each day. Thus, we are able to assure continuous availability of Medicaid to the state's 415,000 welfare recipients while staying within the budget," according to James K. Linnan, director of the Jacksonville Data Center of the Florida Department of Health and Rehabilitative Services.

In operation just over a year, Florida's Medicaid computer-communications network consists of two RCA Spectra 70/45 computers linked to 59 video data terminals.

"No doctor, hospital, laboratory or nursing home in the state can provide Medicaid services without prior authorization from the computer system," Linnan explained.

To do this quickly, an identification card has been issued to every welfare recipient. Before a person is treated, the information on his card plus a description of the required service is telephoned by the medical provider to the nearest terminal center.

An operator at the center enters this data and the name of the medical provider on the terminal which transmits the data to computers in Jacksonville. If the individual is eligible for the designated service a transaction number is generated by the computer, transmitted to the terminal center and displayed on the CRT.

This transaction number also is used for billing and appears on the provider's statement, which is printed by the computer and issued within 10 days following patient treatment. All the doctor, hospital or laboratory must do is indicate the type and cost of treatment, then return the statement to Jacksonville from where it is paid within 30 days.

DP Profile

Afips to Survey Societies' Personnel

MONTVALE, N.J. – A personnel survey of the membership of 13 national professional societies in the computer and information processing field is being conducted by the American Federation of Information Processing Societies (Afips).

The survey is being conducted with the cooperation of Afips' 12 constituent societies and the Data Processing Management Association (DPMA).

Questionnaires have been sent to a statistical sampling of 23,000 individuals, representing approximately 20% of the total membership of each participating society. An analysis of the results of the survey will be published by Afips Press in mid-1971 and will provide a comprehensive profile of the computer professional.

Included in the report will be detailed information covering general personnel data, education, employment, professional activities and salaries.

According to Afips' executive director, Dr. Bruce Gilchrist, "The results of the survey will provide valuable information to a variety of interested groups, including government and industry planners, educators, professional societies and private individuals in the computing field."

Seminars Focus On Job Placement

NEW YORK – Over 150 applicants attended a series of five professional placement seminars conducted by the Association for Computing Machinery (ACM).

Designed to help unemployed ACM members find jobs, the sessions reviewed the DP job market, demonstrated how to write a resume and concluded with individual interviews with experienced placement professionals.

One seminar was conducted by Stan S. Closman, director of personnel services at Data Dimensions, Inc., an executive search and placement firm specializing in data processing.

COMPUTERWORLD

societies/user groups

SJCC Program Reflects 'Responsibility' Theme

By Edward J. Bride
CW Staff Writer

ATLANTIC CITY, N.J. – What's wrong with this? Who's responsible for this? How can this be improved?

Whether "this" means computer technology itself, the employment picture for computer professionals, or the effect of computers on society and government, the questions will be explored thoroughly at the Spring Joint Computer Conference (SJCC), to be held here May 18-20.

There are generally two messages which emanate from the "joints," an industrial trend as seen on the exhibit floor, and a "social" or "technical" one as seen in the program sessions. Whether the latter tone is social or technical normally depends on the mood of the computer professionals, and this spring it definitely reflects the theme "Responsibility" in the community sense.

Preconference publicity shows a comprehensive, searching program, which was "carefully and judiciously guided to reflect the conference theme," according to the sponsor, the American Federation of Information Processing Societies (Afips).

A preview of the messages will be seen in the lead-off session, called "Computing Machines – Menace or Messiah?"

Besides highlighting the more controversial or unusual sessions, a panel discussion will examine the theme as it relates to the technical program, and to current conditions in the computing field.

Chairman of the session is Stanley Winkler of IBM. Moderator of the session is a civil libertarian and one of the most severe IBM critics, Dr. H.R.J. Grosch of the National Bureau of Standards.

Examines Computer Image

After lunch (this all takes place Tuesday morning), attendees will have a choice of several sessions, including one chaired by Jules Bergmen, science editor of ABC News. The attitudes of the lay public towards the industry will be explored by a panel of journalists and writers in this session, appropriately entitled "Image of the Industry."

Spread through the other 34 program sessions are six meetings examining the "New Technology." They are divided into diagnostics and recovery, systems software, hardware design and evaluation, storage, file organization and computer architecture.

An ecology forum will be one of the special activities.

Scheduled for the evening of May 19, it will feature "eminent authorities and academicians from all disciplines," Afips said. The chairman will be Lawrence J. Fogel, president of Decision Science.

The environment will also be the subject of a Tuesday afternoon session: "Computer Aided Management of Earth Resources."

'Early Naivete'

Another timely subject suggested to Afips has been taken up by a panel of government officials, computer users and industry representatives. Called "The Computer Professional and the Changing Job Market," the session is intended to examine a climate that is "currently adjusting from . . . unrealistic opportunism caused by early naivete . . . of employers and users."

Since it is anticipated these changes will continue and possibly even accelerate, the causes and alternatives should be of great value to computer users and their employees.

One session will consist of state-of-the-art surveys of computer usage in law enforcement and the administration of justice, while others will deal with responsive government and the application of computers to training.

Evaluations

There will also be sessions designed to assist users in evaluating hardware, from both the performance and the acquisition viewpoints.

Some technical sessions will deal with microprogramming and emulation, computational complexity, computer animation, artificial intelligence and computer pictorics.

DPMA, ACM Units Mull Licensing

CW West Coast Bureau

LOS ANGELES – Opponents from both sides of the issue squared off recently when the local chapters of DPMA and ACM met to consider the possible licensing of programmers.

State Sen. Alfred Song, who in the last legislative session had initiated a bill to require such licensing, was expected as a panelist but did not appear.

Among the panelists at the meeting, the main objector to licensing was Dr. Richard W. Hamming, Bell Telephone Labs, who said: "We do not know what we're trying to do with licensing. Even if we did know what we're trying to do we don't know how."

Donn Parker, Stanford Research Institute, represented Afips position that licensing is inevitable and the groundwork must be laid now.

Congressmen Learn About Data Systems

CW Washington Bureau

WASHINGTON, D.C. – "The elements of our society are entitled to privacy, and the integrity of any files containing information on their past activities or present status deserves the utmost protection."

This statement was made by Robert L. Chartrand, specialist in information sciences, legislative reference service, Library of Congress, at a one-day conference here for congressmen and their staffs on the promises and problems of information systems.

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The purpose of the seminar was to acquaint congressmen and their staffs with the current problems and future developments in information systems and to lay the groundwork for a continuing dialogue between the Congress and the computer profession.

Chartrand asked where the line is drawn "on what is demanded of the private citizen, or the corporation. Should not the individual be able to refuse to answer certain questions about his past, and do so without penelty or censure?

Used for Other Purposes

"In some instances," he added, "information collected from citizens for one purpose is then vended to others for completely different purposes. The built-in protection inherent in the decentralized, paper-oriented files of the past now is being obliterated by the capacities and capabilities of computer-supported information systems."

In another speech, Louis Feldner, vice-president of business planning for On-Line Computer Corp., suggested that the Federal Government set up an information "early warning system" for public officials. "We cannot afford to wait five, 10 or 15 years to see what the social impact will be of data banks or what the resultant impacts will be, say, of spreading credit cards throughout the whole economy, or of creating information systems, or of having computer terminals in a great many homes in the U.S.," Feldner said.

This early information, he added, "must somehow become plugged into the decision making, regulatory and law-making processes."

Afips Press has released the text of six papers presented in book form for $5 a copy.

Call for Papers

SIXTH ANNUAL ACM URBAN SYMPOSIUM, Oct. 28, New York.

The purpose of the symposium is to provide a forum for exchange of ideas and information between interested professionals from the computing field and from urban problem areas.

Papers are solicited on computer applications and experiments in urban information systems, urban planning and other areas concerning computing and urban problems.

To submit a paper, send a postcard, as soon as possible, stating the subject area, author's name, affiliation, business address, and telephone number to Gordon Gebert, School of Architecture, City College of N.Y., 138th St. and Convent Ave., New York, N.Y. Five copies of the entire paper must be submitted by June 1, 1971.

FIFTH ANNUAL INSTRUMENTATION FAIR, Sept. 9-10, Washington, D.C.

Application papers are solicited on time-share computer services and terminals for instrumentation application, information retrieval for the scientist and engineer, instrumentation and ecology, new data acquisition systems and advances in calibration in the areas of increased precision and automation.

A 500-word summary of the paper and the name of the author, title, company telephone number, technical society affiliations and a brief biography should be submitted to Instrumentation Fair, Inc., P.O. Box 479, McLean, Va. 22101, before April 15. The deadline for complete manuscripts is June 15, 1971.

Bibliographic Search

PALO ALTO, Calif. – Thirty-eight information scientists took part here in a special Afips-sponsored workshop on "The User Interface for Interactive Search of Bibliographic Data Bases."

Proceedings of the workshop, including invited papers as well as "critical minutes" based on discussions during the meeting, will be published by Afips Press.

Calendar

March 22-24, Anaheim, Calif. – Numerical Control Society's Eighth Annual Meeting and Technical Conference. Contact: William H. White, Numerical Control Society, 44 Nassau St., Princeton, N.J. 08540.

March 22-24, Los Angeles – Symposium "Information Systems for Management: Real-World Interaction with Computer Based Technology." Contact: Continuing Education in Engineering and Science, 6115 Mathematical Sciences Building, UCLA, Los Angeles, Calif. 90024.

March 22-25, New York – IEEE International Convention and Exhibition. Contact: IEEE Headquarters, 345 E. 47th St., New York, N.Y. 10017.

March 22-26, Phoenix, Ariz. – Spring Conference of the Univac User's Group USE. Contact: C.J. Wurst, Executive Secretary, USE, Univac Division of Sperry Rand Corp., P.O. Box 500, Blue Bell, Pa. 19422.

March 23-26, Lancaster, Pa. – Third National Meeting of the Information Industry Association. Contact: Paul G. Zurkowski, Information Industry Association, 1025 Fifteenth St., N.W., Washington, D.C. 20005.

March 29-April 2, Nottingham, England – Datafair '71 Conference. Datafair '71 Conference Office, The British Computer Society, 21 Lamb's Conduit St., London, W.C.1, England.

March 31-April 3, New Orleans – International Business Forms Industries Annual Meeting. Contact: IBFI, 1730 Lynn St., Rosslyn, Va. 22209.

April 1-2, College Park, Md. – ACM Symposium on Information Storage and Retrieval. Contact: Dr. Jack Minker, Computer Science Center, University of Maryland, College Park, Md. 20742.

April 1-2, Blacksburg, Va. – Virginia Computer Users' Conference sponsored by the Virginia Polytechnic Institute and State University's student chapter of ACM. Contact: Prof. Bruce Klein, Computer Science Dept., VPI & SU, Blacksburg, Va. 24061.

April 5-8, New York – The First National Educational Technology Conference. Contact: Conference Manager, Educational Technology, Englewood Cliffs, N.J. 07632.

April 5-8, Denver, Colo. – 1971 Spring Meeting of HUG (Honeywell Users Group). Contact: J.A. Heald, General Motors Corp., 6-263 General Motors Building, Detroit, Mich. 48202.

April 13-16, Toronto, Ontario – Ninth Annual Convention of the Association for Educational Data Systems. Contact: AEDS Convention, P.O. Box 426, Don Mills, Ontario, Canada.

Variety of Emphasis on DP Courses Linked to Future Roles of Managers

COLORADO SPRINGS, Colo. – The variety of emphasis given to the role of DP in a graduate school of business curriculum appears closely linked to uncertainty over the role future managers will be expected to play in the design of decision systems of the future.

Part of the diversity of programs in effect is probably attributable to the unresolved question: "What level of computer-based information expertise must managers have to perform their role in organizations of the future?"

Professors' answers ranged from passing acquaintance to the belief that managers would be their own specialists.

An important theme which seemed to illustrate the disagreement among participants was: "What role should the manager play in the design of decision systems of the future: co-designer, critic, judge or merely acceptor?"

All beginning courses introduce the student to programming, but a wide range of expected expertise exists, according to the meeting participants. In schools which rely on "canned programs and preprogrammed exercises," the report stated, programming expertise is modest, with greater attention devoted to more functionally oriented activities. But in schools where the computer course is heavily oriented towards quantitative methods, strong emphasis is given to programming.

A recommendation of the meetings was that the "level of expertise desired in programming should be close to that required by the remainder of the curriculum."

"Too strong a programming requirement followed by no utilization of the skill appears to encourage student dislike and discontent. Some familiarity with programming is universally accepted as necessary for students who intend to be managers . . ."

A dichotomy emerged over the emphasis quantitative techniques throughout the course should receive.

One group said it was necessary, emphasizing the problem-solving algorithms one can use with a computer, while the other group felt that quantitative influence should be separate and distinct from the basic course in order to emphasize the design of information systems, including file structure, retrieval and manipulation.

A recurring theme was that DP instruction should be relevant to the rest of the curriculum and could possibly be an integrating element.

Increasing attention, the report noted, is being given to the design of the introductory course so that it supports other courses in the curriculum.

The aim of such courses has changed from a passing knowledge of jargon and programming to reliance on the computer-based system to aid analysis.

Faculty training efforts are on the increase. "Recent experience would indicate it is more feasible and desirable to train experienced teacher researchers in a variety of business specializations than to train computer specialists in the business subjects."

In a series of meetings sponsored by the Curriculum Committee on Computer Education for Management (Association for Computing Machinery), professors from business schools explored the role of DP within business schools. A summary report was published in *Computing Newsletter*.

COMPUTERWORLD

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NSF Renews Center Software Grant

MADISON, Wis. – The Data and Computation Center (Dacc) at the University of Wisconsin here has obtained a renewal of its grant from the National Science Foundation (NSF). Dacc will be able to continue developing general applications software for statistical analysis, linear and non-linear programming and batch and on-line information systems.

Presently, Dacc is developing a Social Science Information Management System (Sims). Although written primarily for researchers, Sims is suited to all areas of research.

Seven Schools Join Virginia Regional Net

WILLIAMSBURG, Va. – Seven schools last year joined a state-sponsored regional data processing network that uses a 360/50 at William and Mary College. With 15 schools in the network, the number of students who use the facilities regularly has more than doubled to 1,944 from 921 a year earlier.

Hampton Institute, Bethel, Hampton, Kecoughtan and Pembroke High Schools in Hampton; Tidewater Community College in Portsmouth; and Virginia Commonwealth University in Richmond, joined the network last year.

Contest Entry Combines DP and Sociology

SKOKIE, Ill. – A 17-year-old boy combined sociology and computer science to become one of 10 finalists in the nationwide Westinghouse Science Talent Search, which offers 10 prizes from $4,000 to $10,000.

Warren G. Lavey's project, a study of racially changing neighborhoods, indicated to him that neighborhoods change from white to black at different times, at different rates and to different degrees. All these differences can be predicted by the computer study of certain variables, he said.

Guide for Software Patent Holders Issued

SAN MATEO, Calif. – If you have a good chance of patenting that program but don't know what to do afterwards, a survey will soon be available listing patent development and marketing organizations.

The survey will be published by TTA Information Services Company here, and lists and describes 90 organizations that specialize in refining patents and products for commercial application, and locating manufacturers willing to bring them to the marketplace.

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Who says the mini is dead?

A computer fashion forecast from Cybermatics Inc., Fort Lee, New Jersey.

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We're up to our ears in mini-computers. We design software for them.

We're not denying that minis raise problems. They come without much software, so they demand more know-how than most companies can muster. They're a little like mini-skirts: You've got to be sure of yourself to get into them.

A call to Cybermatics (201-461-6171) can give you that sureness.

We don't make minis. Or sell minis. But we're experts at using them in on-line systems. We have to be. Many of our clients (computer-sophisticated companies who were in maxis when we met them) are now getting into minis as well.

The minis cost less to buy, cost less to run, take up less space and save wear and tear on their maxis.

Maximizing this potential takes talent, but in all immodesty we have that talent. In fact, of the eighteen great brains in on-line computers, four already work at Cybermatics.

COMPUTER INDUSTRY

a Computerworld news section about the nation's fastest growing industry

March 17, 1971

CI Notes

Semi, Mainiaframe Pact Due

PALO ALTO, Calif. – The semiconductor memory industry here is holding its breath waiting for the first big mainframe order, and most informers finger Burroughs as the most likely candidate for the honor of announcing the first big pact.

Sources in many of the semi houses indicate that Burroughs has been actively testing their equipment over the past year and say that an announcement should be forthcoming in the next three to nine months.

Some long-shot players, however, are betting that a large Japanese computer maker will be the first outside of IBM to incorporate semi memories in a large system – and therefore the first to order.

First Facom Order Falls

NEW YORK – Squibb Beech-Nut has decided not to acquire a Facom 230-25, A spokesman told CW that the firm's "conditional order" had been withdrawn because the system had more processing power then was needed. Squibb had been evaluating the Facom system as a possible replacement for its 360/25.

Telex-CDC Ink Disk Pact

SUNNYVALE, Calif. – Telex and Control Data Corp. have entered into a four-year agreement to develop and produce an advanced disk drive subsystem. Controller development will be carried out here by Telex's new Direct Access Storage Division, while CDC will manufacture the disk drives in Minneapolis. Neither firm would comment, but industry sources believe that the new system will be IBM 3330 compatible.

AF Invites Proposals

HANSCOM FIELD, Mass. – Thirty-three computer manufacturers have been invited by the Electronic Systems Division of the Air Force Systems Command to submit proposals for the installation of automatic DP equipment at Edwards Air Force Base, Calif.

Major equipment to be replaced consists of an IBM 7044/7094I, an IBM 7094, an IBM 1620 and an Adage A-200 coupled to an in-house built digital data processing system. The new equipment will require five to six times the throughput power of an IBM 7044/7094I system.

Supershorts

Information Storage Systems is readying an announcement of a double density 406 cylinder disk drive with average access times below 50 msec as an OEM product for systems houses, CW has learned. Formal announcement should come this week.

– – –

Sanders Associates, Inc. has received a more than $7 million order from Avis Rent A Car System for several hundred automated hard copy terminals, more than 100 cathode ray tube displays and six Sandac communications processors.

– – –

Athena Systems, Inc. will supply 5,000 credit card readers to American Regitel Corp. of San Carlos, Calif., under a recently signed $500,000, three-year contract.

1970 DP Market Study

Medical, Service Areas Show Big Gains

By E. Drake Lundell Jr.
CW Computer Industry Editor

NEWTON, Mass. – An analysis of the computer market structure in the U.S. shows that the medical and health services area was the fastest growing during 1970, but that manufacturing applications still dominate the installed market base.

Developed from statistics compiled by International Data Corp. here, the analysis shows that RCA will win out in the hot race for the number two slot in the industry domestically, but that Honeywell will come out on top worldwide.

In the U.S. market structure, 38% of the computers are presently installed in manufacturing installations, the figures show, but this segment of the market grew by only 3% over the past year.

Medical and health services, the statistics indicate, only account for 2.2% of the computers presently installed, but this market grew at a phenomenal 27% last year. The second largest growth rate (13%) was chalked up by the service industry, which presently accounts for 10.1% of the installations in the U.S.

Other Markets Show Gains

The banking and financial area, which accounts for 10.6% of the present installations, grew only 5% between 1969 and 1970 and the Federal Government market, which accounts for 7.3% of the installed computers, only chalked up a 3% growth.

Following the medical and health and services areas in terms of growth during the year were the state and local government sector, which grew by 8%, the wholesale industry (8%), the communication and utility field (7%) and the insurance industry (7%).

At present, state and local governments account for 4.7% of the installed computers; the wholesale industry, 4.5%; communications and utilities, 3.7%; and insurance firms 5.5%.

In the present market structure in the U.S., medium-sized systems (renting for under $10,000/mo) account for 44% of the installations in terms of number of installed systems.

Large computers (renting for under $40,000) account for 33% of the computers in the field, and small systems (less than $2,500/mo) account for 20% of the installed base. Very large systems are in use at only 3% of the computer sites.

No. 2 Race Heats Up

In terms of new shipments in 1971, RCA is expected to grab 16.2% on the domestic scene, followed by Burroughs (5.7%), Honeywell (5.1%), NCR, Univac, Digital Equipment and Control Data in that order.

In the international market, however, Honeywell will grab a 10% market share in new shipments during the year, according to the projections. The firm will be followed by Univac (8%), Burroughs (5.7%), NCR, Control Data, RCA and Digital.

The combination of the domestic and international markets will give Honeywell a solid 7.1% of the worldwide shipments, for a value of $599 million, outdistancing its nearest competitor, Univac, by over a percentage point and by almost $100 million.

Ampex Plans Disk Replacement For Univac Fastrand Drum Unit

CULVER CITY, Calif.– The Ampex Computer Products Division will supplement its line of IBM-compatible equipment with a Univac Fastrand replacement unit in the next month, CW has learned.

The new unit will replace the Fastrand drum system with six disk units (using Ampex's 2314-compatible drive) and a specially built controller. It will be directly compatible with the Univac 1100 series of computer systems.

Advantages of the new system over the Fastrand drum will include an access time of 32 msec compared with 92 msec on the Fastrand unit and the elimination of the need to dump data onto tape at the end of each working day, Ampex sources said.

The sources also indicated that there have been some reliability problems with the Fastrand units, which should be overcome with the new system.

At present, there are a "couple of hundred" Fastrand installations, Ampex sources said, and this represents a unique situation for penetrating a market outside of the IBM-compatible field.

They added that Ampex and most of the other independent manufacturers would be introducing units that serve the non-IBM market during the next year. "Why only serve 70% of the market, when you could be selling to 100%," one source said.

The first controller in the new line will be shown at the SJCC.

The problems with serving the non-IBM market, sources said, revolve around the economics of support and service. It is harder and more expensive to support a few installations of one manufacturer than to serve the entire IBM market, they said.

EMI Forecasts Core Boom Despite Tales Of Quick Funeral

HAWTHORNE, Calif. – Despite predictions of the imminent death of the core memory industry, this memory market will grow by between 10% and 20% over the next few years, according to Robert Soto of Electronics Memories, Inc.

Soto claims that core's "proven reliability" will keep it viable in the market over the next few years, even though semiconductor memories will begin to make some inroads.

In addition, Soto said that core prices would continue to erode at about the same rate in 1971 as it has in the past few years. In two or three years the price of core memory systems will be between .7 and 1 cent/bit, he predicted.

Because of the lasting power of the core industry, and hot competition, Soto predicted that there would be only two or three firms left in the semiconductor memory business by 1975.

OEM Mini Makers May Pay the Price

By E. Drake Lundell Jr.
CW Computer Industry Editor

The bruising battle on the OEM side of the minicomputer marketplace is taking its toll.

While no one seems to be getting out of the business, most mini makers interviewed during a recent swing through California indicated a desire to rely less on the OEM and more on the end user side of the business.

That's good for the end user – if he is smart enough to shop around and bargain hard – but it will mean dropouts among the mini makers that can't stand the pace in this whole new ballgame.

Gary Cadwallader, vice-president of marketing for Tempo Computers Inc., indicates that at present there are only six to 12 companies that are currently viable in the communication-oriented mini business and said he expects that number to be cut in half within the next year.

At the same time, James J. Orris, director of product management at Varian Data Machines, indicates that by 1975 there will only be six or seven firms left in the entire mini industry.

For Varian, the change in direction is a major step, Orris said, since around 75% of its business at present is on the OEM side. Within two years, however, the firm hopes to achieve a ratio of around 50/50 between the two areas.

On the Road

At Microdata the shift will be even more evident, according to Don D. Pagan, product line manager for the 800 series. Pagan said that at present the firm's business is running about 90% OEM but that it hopes to reverse those figures.

Datacomp Systems Inc., in which the Clary Corp. now has less than a 50% interest, sees major penetration of the end user market several years away, but is beginning a major push into that market through Business Machines and Computers Inc., which will market the systems at first in California and then nationally. BMC owns 38% of Datacomp now.

The major reason for the switch in emphasis is the reduced price of components, according to Varian's Orris. With the costs dropping rapidly for memory elements and chips, Orris said the OEM is deciding more and more to make his computer system himself.

There is not enough "value added to the product" by the middleman to justify his existence, he indicated, adding that the mini maker was going to have to offer something more than a piece of hardware "and a handshake" if he was to be successful.

This is the first in a series of articles resulting from a recent two-week trip to the West Coast by CI Editor Lundell.

Contracts

The Electronics Division of Avco Corp. has renewed a blanket contract for $50,000 with Com-Share's Cincinnati district office for one year of Com-Share time-sharing service.

Honeywell's Tampa, Fla., operations will enter second-year production of the APX-72 transponder under a $7 million Navy pact.

AAI Corp., Baltimore, Md., has awarded a contract in excess of $350,000 to Systems Engineering Laboratories, Inc., Ft. Lauderdale, Fla., for a Systems 86 system to control an Air Force Simulator for Electronic Warfare Training.

Computer Sciences Corp. has received an initial five-year contract for $11 million from RCA Corp. to develop major elements of the computer software required for the U.S. Navy's Aegis defensive missile system.

The U.S. Postal Service, Research and Engineering Department, has awarded a $899,674 contract to Computer Identics Corp., Westwood, Mass., for the development of a real-time, computerized postal vehicle control system for the Oakland Postal Facility, Oakland, Calif.

Computek, Inc., Cambridge, Mass., has a contract for 24 of its Model 400 terminals with the Center for Computer-Based Behavioral Studies at UCLA.

Computing and Software, Inc., Los Angeles, has won a one-year contract and two one-year renewal options, valued in excess of $800,000, to operate the Biodata Analysis Laboratory of the Directorate of Biomedical Programs at Nasa's Flight Research Center, Edwards, Calif.

Cunadata Corp., Madison, Wis., has accepted a bid of $30,000 from General Electric Information Systems to develop a detailed system design for the credit union computer utility.

Standardization Work Should Provide For Experience in Various Applications

By D. Hekimi
Special to Computerworld

One of the biggest difficulties in international standardization work is generally the lack of interest of users for this type of work. Manufacturers are in general supporting standards because they believe in their intrinsic value within a company as well as within a country or an industry.

For the manufacturer the advantages are clearly complementary. He has a chance to offer better and/or less expensive products to his competitor's customers, without being faced with the situation today, in which a change of supplier is often simply too costly to be considered at all – independently of the quality of the new products offered.

In most international meetings, however, as soon as a good document proposed for international standardization is presented, each national delegation is ready to accept it provided the differences with its own national standard are eliminated .... When this is done, that wonderful document becomes generally a sheet of white paper.

It is in this situation that users' participation in standardization could be of real help.

Seen from this point of view, it appears desirable that the users participating in standardization work should provide for the experience gathered in various applications, e.g. banking, transportation, credit cards, mail order houses, etc., rather than representing strictly the restricted interests of groups of customers of the different manufacturers.

Standardization must be carried out with a certain amount of idealism and standardization committees should not be the place for fighting lobby parties.

This philosophy can work if it is applied consequently and if it is realized that it represents the only way out.

In this respect it is of interest to consider a preliminary draft proposed American National Standards presently under work in an Ansi committee. It comprises a "Product Conformance" clause listing three categories:

- Criteria for conformance.
- Criteria for nonconformance.
- A statement that if both groups of criteria are not met, then the product is considered "to be outside the scope of this standard. As such, it shall not be adjudged to be either in conformance or in nonconformance with regard to this standard."

This type of subtlety is barely understandable for a normal mind. It should not be necessary to apply such a twisted thinking to what should be a simple problem. If a standard is clearly and intelligently formulated, then there is only one alternative: either conformance or not.

It is very strongly felt that the above mentioned type of clause is likely to discredit standardization rather than help it.

D. Hekimi is secretary general of the European Computer Manufacturers Association and, as such, his comments on American standards should be "food for thought" in the multinational computer field.

Major OEM Customer Sought By Cogar

CW European Bureau

MUNICH – The Cogar Corp., which has just commenced major marketing operations in Europe, is looking initially for one major OEM customer, according to George R. Cogar, president of the company. Germany has been selected as the current base because of the size of the market, but he indicated that he already has high hopes of a major deal with ICL, but that this was arranged in the U.S.

It is hoped by Cogar that by 1972 up to 25% of production could be coming to Europe.

Although Cogar interests range from semiconductor technology to the System 4 data prep system, the firm expects to market larger systems in the future and is, according to Cogar, also ready to license its technology to other users. Cogar said he expects more than 80% of business to originate from the technology division.

USSR Could Reach U.S. Computing Level in 10 Years

SANTA MONICA, Calif. – The Soviet Union has "the raw technical potential to achieve something near parity in computing with the U.S. within 10 years," a senior computer scientist of The Rand Corp. writes in the first general-public issue of *Soviet Cybernetics Review*.

Russia's serious lack of computer power for general use has obscured the impressive technical potential exhibited in its space program, reports Dr. Barry W. Boehm, head of Rand's Computer Systems Analysis Group. Boehm recently returned from a two-week tour of Russian installations.

Boehm writes that the Soviets "have a fairly compact standard spaceborne computer with 4,000 16-bit words of read-only core memory and 256 words of erasable memory, with a speed of about 100,000 operation/sec . . . Estimates of Soviet computing capability for high-priority, special-purpose applications (e.g., space and military) will probably be low if they are based on observations of Soviet general-purpose computing capability." He said the most advanced general-purpose machine was the BESM-6, equivalent to the IBM 7094.

Boehm's analysis of Soviet computing in general is that it suffers from a serious lack of hardware, a "very ragged situation" in software, and "virtually nonexistent" support services.

The Russians' most serious computer problem, he adds, is lack of centralized planning by government, science and industry to provide systems oriented more effectively to the needs of general users throughout the economy. He notes that the U.S. competitive economy gave birth to computer user groups for sharing computer facilities, while the Soviet state-oriented system has not produced counterparts for coordination and sharing.

"Many people within the USSR have indicated the need for stronger coordination of the efforts of the Academy institutes and industry, and for more user-orientation in the design, production and servicing of computer systems," he said. "As long as this centralization is not carried out, I think the U.S. will stay comfortably ahead in computer technology and usage. However, our lead in space and military applications will probably be less than our lead in general-purpose computing.

"If the decision is made to centralize, the future situation depends on the choice of a top man . . . What they need is a tough-minded, pragmatic technical man, like Korolev provided them for their rocket and space program. If they find him, they have the raw technical potential to achieve something near parity in computing with the U.S. in 10 years." Boehm indicates that no appearance of such a leader or movement seemed imminent at this time in his discussions with Soviet computer scientists.

Small Firm Does Well in Europe

NEW YORK – Early entry into the European market enabled Computer Machinery Corp. (CMC) to broaden its sales potential by 50% and to capitalize on its "innovative advantage," according to CMC President James K. Sweeney.

Speaking at the recent Annual International Finance Conference of the American Management Association, Sweeney indicated that small size might be a help for a firm entering Europe for the first time, despite high start-up costs.

"Although our move into Europe was expensive," said Sweeney "it could have been more expensive – and riskier – later."

On the side for entry, Sweeney said that extensive research showed favorable marketing conditions for his company's product. Secondly, he noted that CMC's small size also proved to be favorable since it provoked less concern on the part of governments and labor unions than a giant firm whose every move generates economic repercussions.

Sweeney also listed three disadvantages to be considered – lack of experience in European ways of business; immediate drain on limited capital; and variations within the European market such as laws, monetary policies, transportation facilities, attitudes toward work and degree of governmental involvement.

Sweeney offered some pointers concerning the critical period before the new operation is launched. "Adopt a low profile," he advised, "and blend into the business environment of the host country. Play by that country's rules.

"Secondly, work closely with government officials, keep them informed as to what you intend to do – and what you are doing."

Sweeney advised that once a company determines that it has an innovative advantage and that there is a significant market potential or manufacturing advantage in Europe, size alone should not deter it from entering that marketplace.

Executive Corner

■ Leonard Kedson has been named president and chief operating officer, as well as member of the board, of Solid State Scientific Devices Corp., Montgomeryville, Pa.

■ Geoff Taylor has been promoted to vice-president, director of marketing, and Min Tonai has been named vice-president, director of finance, of Peripheral Equipment Corp., Chatsworth, Calif.

■ David F. Conrod has been named vice-president and director of marketing services, and Ernest R. DelMonico has been named vice-president and director of field operations at Data Facilities Management, Inc., Stamford, Conn.

■ Computer Entry Systems Corp., Silver Spring, Md., has elected Anthony J. Vendemia vice-president for manufacturing.

■ Data Automation Co., Inc. of Dallas has announced the following appointments: Loyse E. Caldwell, chairman of the board, president and chief executive officer, and James E. Nicholl, Jr., executive vice-president.

■ Mohawk Data Sciences Corp., Herkimer, N.Y., has appointed John J. Egan Jr. vice-president, end-user marketing.

■ Eugene A. Brannock has been named vice-president, business services of Informatics Tisco, Inc., Riverdale, Md.

Orders and Installations

Direct Access Computer Corp., Troy, Mich., has acquired a $1.7 million Univac 1106 system for time-sharing services.

White Machine Co., Kenilworth, N.J., has ordered an IBM 3/6 for general accounting purposes.

NCR Century 100s have been installed by the City of Cedar Rapids, Iowa; the Illinois Retail Hardware Assoc. of Mt. Prospect, Ill.; and St. Therese Hospital of Waukegan, Ill.

Rome Research Inc. of New York has placed in operation a Key-Edit shared-processor data-preparation system from Consolidated Computer International, Waltham, Mass.

M. Loeb Ltd. is using Digitronics Data-Verter automated store order entry equipment in stores throughout Ottawa, Canada.

The Massachusetts Registry of Motor Vehicles has ordered a Control Data 3300, valued at $1.5 million, to build and maintain automobile registration files and to provide inquiry and retrieval system on driver records and related information.

Mankato State College, St. Paul, Minn., has purchased a Univac 1106, valued at about $1 million, to be used for administrative and academic work.

An IBM 370/145 has been ordered by the Central Illinois Light Co., Peoria, Ill., to help process customer orders.

Willard Tape Transports Have 125 in./sec Rewind Speed

LOS ANGELES – Willard Laboratories has announced the Series 7/9 tape transports, including six 7-track and four 9-track models, which are IBM-compatible as well as plug-for-plug and pin-for-pin compatible with PEC, Ampex and Wang tape units.

All members of the series have a single capstan drive, basic forward speed of 12-1/2 in./sec and are available with recording densities of 200, 556, 800 and 1,600 bit/in. Recording modes are available in NRZI on 7-track models (IBM-compatible) and NRZI and phase encoding on 9-track models (Usascii-compatible). Rewind speed is 125 in./sec.

Prices start at $2,150 for single gap 7- or 9-channel models at 100 OEM level and $2,400 for dual gap 7- or 9-channel models at 100 OEM level. Delivery is within 60 days from the firm at 4221 Redwood Ave.

New OEM Products

Ampex Core Stack Debuts

CULVER CITY, Calif. – A digitized core memory stack for small data systems is being marketed by Ampex. The new stack is priced at 2-1/2 cent/bit in production quantities, and is designed for use in the small memories of desk calculators and other compact DP equipment. It is available 60 days after order.

Configurations of the stack may be 512, 1,024, 2,048 and 4,096 words by 6 or 8 bits, on one planar pluggable board which measures 6 in. by 5 in. by .5 in. It has a full cycle time of 1.5 μsec with 18- and 22-mil Ampex cores or 2 μsec with 30-mil cores. It uses 4-wire 3D design.

Model 37 Keyboard Announced

BURLINGTON, Mass. – A Model 37 teletypewriter-configuration keyboard, designed for data transmission, has been announced by Data Electronics Corp. The MK-37/2040 has additional function keys for use in a CRT display terminal.

The keyboard is said to be insensitive to RFI and electrostatics, and operates at 0-70°C with 0-95% relative humidity. It typically draws 300 mA from a 5 V supply. Standard features of the MK-37/2040 include the full, 128 Ascii code, 12 additional function keys, three operating modes, two-key rollover, error and data lockout and a DTL/TTL interface with positive logic. Optional features include parity, automatic repeat, electronic shift lock and the code selection choices.

Ampex Core Memory Stack

Willard Series 7/9 Tape Transport

Intel Sets 1101 Replacement

MOUNTAIN VIEW, Calif. – Intel Corp. has combined a smaller chip with a plastic package to introduce a lower priced version of Type 1101, a 256-bit silicon-gate MOS RAM introduced in 1969.

A pin-for-pin replacement for Type 1101, the new RAM is designated Type P1101A. The same chip is available in a ceramic package as Type C1101A, also at reduced cost.

The P1101A is available in quantities of 1-24 for $20; in quantities of 25-99 for $16.25; and in quantities of 100-999 for $12.80. The C1101A is available in quantities of 1-24 for $24; in quantities of 25-99 for $19.60; and in quantities of 100-999 for $15.40.

Intel's P1101A and C1101A are 256-bit static RAMs using silicon-gate MOS technology.

Computer Automation Bares $1,700 Mini

NEWPORT BEACH, Calif. – A new low price mark was set last week in the OEM side of the minicomputer business with the announcement of a $1,700 unit by Computer Automation Inc.

For $1,700, in quantities of 200, the Naked-Mini contains 4K of core memory and a parallel processor, assembled into 15 in. by 15 in. modules. It is stripped of its power supply, console and metal chassis.

Operationally the Naked-Mini computers are identical to the company's existing Models 116, 216, 108, 208 and 808, which contain such features as hardware multiply/divide, direct memory channels, automatic memory scan, block load and dump and vectored hardware priority interrupts. First quantity deliveries of the Naked-Mini are scheduled for November 1971.

"At this cost, we believe many OEM companies will order the stripped minicomputer from us rather than manufacture their own," according to CA President David Methvin.

National Computing Centre Lists 7,700 UK Computers

LONDON – The National Computing Centre of Britain lists the number of computers installed in the United Kingdom as 7,700, in 5,800 locations in a report presented to the House of Commons Subcommittee on Computers. The number of establishments using computers, the report said, was 25,000, with the total number of people directly involved with the computer industry being 194,000.

There are 265 computer hardware suppliers in the United Kingdom, according to the report, and 746 firms providing bureau, software or consultant services. The report indicated 465 firms offered accessories, installation services and consumable supplies.

COMPUTERWORLD

financial

Creditors Are Satisfied, Dicom Leaves Bankruptcy

SUNNYVALE, Calif. – Although seeing a computer company file bankruptcy petitions is not unusual anymore, it is encouraging to see one reverse the process.

Dicom is out of bankruptcy, according to T.A. McChristy, president of Dicom Industries, a manufacturer of cassette magnetic tape systems and cassette magnetic tape operating systems for minicomputers.

A majority of the creditors approved the plan of arrangement.

Dicom filed bankruptcy under Chapter XI on Aug. 6, 1970, and has received additional capital from new and present investors of approximately $500,000.

"We are pleased that we have been able to secure OEM orders with Hewlett-Packard, Fairchild, Varian Associates, and Business Machines & Computers, Inc. during this period of bankruptcy, which gives us a good base from which to grow," McChristy stated.

$100 Million by '75?

1971 May See First Fujitsu Invasion

By Daniel R. McGlynn
Special to Computerworld

NEW YORK – While the first installation of a Fujitsu mainframe in the U.S. has bogged down [See CI Notes, Page 41], industry experts admit that the first attack of the Japanese invasion is likely this year.

Fujitsu has talked of plans to capture $100 million of U.S. computer business by 1975, and since it is the only major Japanese manufacturer that is not banned from the U.S. by some type of cross-licensing arrangement, it is worth a look.

Fujitsu, Ltd., established in 1935 as a manufacturer of telephone equipment, entered the field of electronic computation in 1954, and developed a numerical control computer, Fanuc, in 1956.

Of the company's 1969 sales of $332 million, 36% came from computers and data communication equipment.

The company's first major computer product was the Facom 212 introduced in 1959, renting at about $800/mo. The Facom 231, similar to IBM's 1401, was first delivered in 1963, and was exhibited at the 1963-1964 New York World's Fair.

Fujitsu introduced its second generation Facom 230 series in 1965. The series ranges from the small 230-10 with 8K core storage to the large 230-50 with up to 65K core storage. Over 1,000 computers in this series are presently installed.

In 1968 the third generation 230-60 was introduced, comparable to IBM's 360/65. There are presently 60 of these larger systems installed and operating.

In 1969 and 1970, the company announced its Facom 230 series models 25, 35, and 45. The new models are essentially price/performance improvements over the older 20, 30, and 40 models. There are presently 300 of these new models in operation in Japan and Southeast Asia.

In a recent interview, Fujitsu President Yoshimitsu Kohra outlined the strengths of his company:

- An international marketing network developed in connection with Fujitsu's other products.
- Proprietary technology developed through in-house research over the five years. Fujitsu is no longer afraid to challenge IBM in the world marketplace.

Large Machine

In discussions with company officials last year in Tokyo, it was learned that Fujitsu is engaged in the development of a large-scale computer in the performance range of the IBM 360/195. The project is part of an industry-wide development effort to strengthen the computer industry in Japan. Over $30 million in government funds have been allocated to the project.

At the other end of the scale, the company's Facom 230-15 is equivalent in power to the IBM System/3, or 360/20. The company expects to sell 4,000 to 5,000 of these units over the next few years. In the field of minicomputers, Fujitsu concedes that the U.S. has a wide lead.

"Fujitsu has taken a risk to enter the international computer market," Kohra noted. "We felt it was our duty to our company, to Japan, to do so. But now we are confident. We have succeeded."

Daniel R. McGlynn, president of Daniel R. McGlynn Associates, is an investment adviser concerned with numerous hardware and software companies.

Leasco to Acquire Abacus in Merger, Firms' Shareholders Must Approve

NEW YORK – Leasco Data Processing will acquire Abacus Fund, a closed-end investment company, by merger.

In return for Abacus' 3.3 million outstanding shares, Leasco will give securities valued at $62.7 million, according to the agreement in principle reached here.

Each Abacus share will be exchanged for one-half share of Leasco's $2.20 Series B convertible preferred and one-third of a 1978 warrant to buy one Leasco common share for $20. Leasco common was selling recently in the $20 range.

The merger is subject to approval by shareholders of each firm. Leasco has assets of $1.2 billion and Abacus $55 million, mostly in cash and securities.

While controllers of at least 40% of Abacus' common have said they would support the merger, two directors of the investment company are known to oppose management and have not commented on the acquisition.

ADR Revenues Up 17% for Record

PRINCETON, N.J. – While the year ended in a loss for Applied Data Research, revenues jumped by 17% to set a record for the company.

Revenues for 1970 were $7.2 million compared with $6.2 million for 1969.

The company has been operating profitably for the past six months but reported a loss of 37 cents a share for the first half of the year. For 1970, the company incurred a loss of $236,646 or 23 cents a share, compared with net earnings of $104,139 or 11 cents a share for 1969.

Proprietary product sales were $2.3 million, compared with $2.8 million in 1969 and it was reported that marketing opportunities were increasing for proprietary products outside the U.S., particularly Europe.

Newer proprietary products, such as Librarian, are contributing to both sales and earnings. President John R. Bennett said. Operating revenues for both the Professional Services and Control Systems Division also increased during 1970.

Wall Street Showed DP Unworldliness In Reaction to Burroughs Software Ills

By Michael Merritt
CW Staff Writer

The recent brouhaha involving Burroughs' troubles with the B6500 shows that Wall Street can occasionally misread the computer industry.

Word of software problems spread through the financial community, and the story grew into one of waves of canceled orders.

Burroughs confirmed that there were development delays, and that some orders had been dropped, though they were replaced by new orders.

A CW survey of B6500 users [CW, March 10] showed that DP managers are much more comfortable with the delays than are the stock analysts and that there has been no wave of canceled orders.

Accustomed to problems developing any operating system – IBM's OS is a good example – users on the whole were not upset. The main problem seemed to be that time-sharing software had not yet been delivered, and potential T/S buyers were holding back orders.

Wall Street's touch of panic betokens a certain unworldliness about the development of new computing systems. The B6500, in particular, is vulnerable to delay because it offers several advanced features.

The B6500 is designed for multiprogramming and its operating system, the Master Control Program, features dynamic resource allocation to optimize use of the system's facilities.

The processors can be dual, the software allows mixing of fixed and floating point modes, and the system can process variable length character strings.

The unit in effect uses virtual memory through program segmentation, and the dynamic resource allocation makes extensive re-entrant coding necessary.

While Burroughs has been working on these developments for years, none of them involves what engineers would call well-known technology. Any scheduling of their implementation means some guess work, which in turn means it is safe to bet there will be delays somewhere.

But surprise at this situation shows lack of knowledge.

As for the money involved, which is what the analysts are concerned with, industry estimates of a fair assignment of average rental range from $45,000 to $70,000. The higher side seems more reasonable, so $60,000 would be a good compromise.

EDP/Industry Reports estimates that as of Oct. 1 there were 24 B6500 installations and 36 unfilled orders.

Allowing for some activity from Burroughs salesmen since October, 75 units at an average rental of $60,000 means $54 million a year in revenues.

Since Burroughs' total revenues for 1970 were $893 million, the B6500 is a significant, though not major, segment of the company's activities.

Once again, the concern of Wall Street is well placed, but a bit overstated. The loss of one account, or even a half dozen, would not alter the firm's earnings greatly. And, if Burroughs' statement is to be believed, the total number of B6500s on order has not shrunk.

All the above is not to say that Burroughs doesn't have problems. The year-end statement shows income from sales, rentals and services of $885 million. Accounts receivable constitute a full 35% of this, $310 million. In other words, it takes Burroughs an average of three months to collect a bill.

Inventories account for well over half of current assets, and have increased 17% since the end of 1969. Inventory, machinery and equipment comprise 42% of total assets. Gross margin is 7%, not bad, but nothing like IBM's 13%.

And one Wall Street writer pointed out that Burroughs' allowance for doubtful accounts on its massive receivables was only .93%, while IBM this year carries an allowance of 2.9%.

And Burroughs has been sued for $70 million by TWA.

Those might be more interesting problems to question Burroughs about.

Nickels & Dimes

Confronted with the possibility of paying out $25 million in damages and court costs to Zenith Radio, Hazeltine President David Wittenmann in a letter to shareholders alludes to the judgment against the corporate parent which remains vacated, implying that damages will have to be borne by the subsidiary, Hazeltine Research, which has assets of only $6.8 million. Ha seems to be saying that while Zenith may have won tha war, it is going to have a herd time collecting reparations.

$$$

Carefully walking the tightrope, Data Automation has renegotiated its debt to its two largest creditors, a bank and IBM, and to two other banks, but one Texas creditor is still talking, and $2.4 million in debentures remain to be renegotiated.

$$$

New name for Caldwell Computer of Dallas – Brooks International.

$$$

Foiled last year in its attempt to acquire U.S. Time Sharing by the shaky stock market, Optimum Systems has returned to the acquisition trail with a vengeance. In the last two months Optimum has picked up 62% of EBS Data Processing of Burlingame Calif., a remant of Computer Applications, and all of International Data Systems, of New Orleans. OSI also recently picked up another bureau in Louisiana, Automated Systems, Inc. of Baton Rouge.

$$$

Our spies in the field say that Information Storage, 2314 supplier to Telex, saw revenues jump from $600,000 to $23 million last year, and that shipments are currently $3.5 million to $4 million a month. A $50 million year on the way?

$$$

Take your bath and come out squeaky clean: Victor Comptometer has written off $3 million of 1968 and 1970 start up costs of its Computer Division. While revenues rose slightly in the last year, from $161.6 million to $163 million, earnings before the write-off fell from $1.73 a share to $1.28. After the special charge earnings dropped to 66 cents a share. The company anticipates that the Computer Division will operate at a profit in 1971.

Computerworld Stock Trading Summary

TRADE*QUOTES

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, MARCH 11, 1971

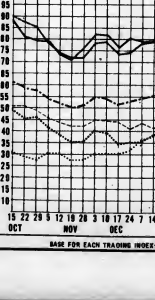
E X C H	1970-71 RANGE (1)	CLOSE MAR 11 1971	WEEK NET CHNGE	WEEK % CHNGE
	SOFTWARE & EDP SERVICES			
O	ADVANCED COMP TECH	1- 2¼	2 1/2	- 1/8	-4.7
O	APPLIED DATA RES.	2¼ 14	11 1/8	-1 1/2	-11.8
O	APPLIED LOGIC	1- 18	1- 5/8	- 1/8	-7.1
O	ARIES	1- 3	1 7/8	0	0.0
N	AUTOMATIC DATA PROC	23- 55	55 1/8	+1 1/2	+2.7
O	AUTO SCIENCES	1- 14	7	+ 1/4	+3.7
O	BRANDON APPLIED SYS	1- 10	3/8	- 1/8	-25.0
O	COMPUTER AGE INDUS.	1- 3	3/4	0	0.0
O	COMPUTER ENVISION	1- 15	1 1/4	0	0.0
O	COMPUTER INDUS.	2- 2¾	5	0	0.0
O	COMPUTER NETWORK	2- 14	7	+1	+16.6
O	COMPUTER PROPERTY	1- 15	3/4	0	0.0
N	COMPUTER SCIENCES	6- 34	12 5/8	+ 3/4	+6.3
O	COMPUTER TASK GROUP	1- 4	1	+ 1/4	+33.3
O	COMPUTER USAGE	2- 13	13	+ 3/4	+6.0
O	COMP AUTOMOT REPORTS	3- 11	7 1/4	+ 3/4	+11.5
O	COMPUTING & SOFTWARE	1- 75	37 1/2	+ 3/8	+1.0
O	COMRESS	1- 10	2 5/8	0	0.0
O	COMSHARE	2- 15	5	+ 3/8	+8.1
O	CONSOL. ANAL. CENT.	1- ¼	1 3/8	0	0.0
O	DATA AUTOMATION	1- 2¾	1 3/4	0	0.0
O	DATA PACKAGING	5- 28	8 1/4	- 3/8	-4.3
O	DATAMATION SERVICE	1- 6	3 1/8	- 1/8	-23.0
O	DATATAB	4- 9	8 3/4	+ 1/2	+9.0
O	DIDITEK	1- 5	2	0	0.0
O	EDP RESOURCES	1- 15	8 7/8	- 1/8	-1.3
A	ELECT COMP PROD	1- 11	5 3/4	+ 5/8	+15.0
O	ELECTRONIC DATA SYS.	31- 101	75	-4	-5.1
O	INFORMATICS	4- 21	9 5/8	+ 1/4	+2.6
A	ITEL	6- 26	19 3/4	+ 3/8	+1.9
O	KEYDATA CORP	7- 14	11 1/4	- 1/2	-4.2
A	MANAGEMENT DATA	7- 25	10	+ 3/8	+3.8
A	NATIONAL CSS INC	1- 16	14 3/4	+1 3/4	+13.5
O	NAT COMP ANALYSTS	1- 8	1 5/8	- 1/8	-7.1
O	NAT.COMP. SERV.	1- 13	3 1/4	- 1/4	-10.9
N	PLANNING RESEARCH	15- 54	21 1/8	- 3/8	-1.7
O	PROGRAMMING METHODS	9- 29	20 1/2	-2	-8.8
O	PROGRAMMING A SYS	2- 5	2 1/2	- 1/8	-4.7
O	PROGRAMMING SCIENCES	1- 35	7/8	-1 1/8	+75.0
O	SCIENTIFIC RESOURCES	1- 22	1 1/2	+ 1/2	+50.0
O	SOFTWARE SYSTEMS	1- 3	1	+ 3/8	+60.0
O	TGS COMPUTER CENTERS	4- 27	6	0	0.0
O	TOLLEY INTL CORP	1- 13	4 1/8	0	0.0
O	UNITED DATA CENTER	5- 14	7	+ 1/8	+1.8
N	UNIVERSITY COMPUTING	14- 99	25 5/8	+ 1/4	+0.9
O	URS SYSTEMS	1- 15	13 3/4	+ 3/4	+5.7
A	U.S. TIME SHARING	1- 14	1 3/4	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	20- 92	32	- 5/8	-1.9
O	ALPHANUMERIC	2- 15	6 3/4	- 5/8	-11.6
A	AMPEX CORP	15- 68	20 1/4	- 5/8	+1.8
O	ASTRODATA	1- 34	1 3/8	+ 1/4	-15.3
O	ATLANTIC TECHNOLOGY	1- 14	3 7/8	+1	+20.5
A	BOLT,BERANEK & NEW	3- 11	7 3/8	+ 1/8	+1.9
N	BUNKER-RAMO	6- 15	14 1/2	+2 1/8	+17.1
O	CALCOMP	11- 35	24 1/4	- 5/8	-2.5
O	COGNITRONICS	3- 13	8 3/8	- 1/8	-1.4
O	COLORADO INSTRUMENTS	1- 12	4 1/4	+1 1/4	+22.7
A	COMPUTER COMMUN.	5- 36	15 1/4	+ 1/4	+1.6
A	COMPUTER EQUIPMENT	4- 12	5 5/8	+ 3/8	+7.1
A	COMPUTEST	12- 28	17 5/8	- 3/8	-2.0
O	CONSOL. COMPUTER LTD.	1- 14	9	-1 1/2	-14.2
A	DATA PRODUCTS CORP	5- 26	8 1/2	+ 1/8	+1.4
O	DATA TECHNOLOGY	1- 23	5 1/2	- 1/8	-2.1
O	DIDITRONICS	3- 13	6 3/8	- 1/8	-2.0
N	ELECTRONIC M A N	6- 40	11 7/8	+ 1/8	+1.0
O	FABRI-TEK	2- 8	2 3/4	- 1/8	-4.3
O	FARMINGTON MFG	1- 17	1 1/2	- 1/8	-7.6
O	FOTO-MEM INC	1- 19	2 1/2	- 1/8	-4.7
O	INFOREX INC	16- 39	33	+1 1/2	+4.7
O	INFORMATION DISPLAYS	3- 10	5 5/8	- 3/8	-6.2
O	MANAGEMENT ASSIST	1- 4	1 5/8	- 1/8	+62.5
A	MARSHALL INDUSTRIES	14- 67	21 3/8	- 5/8	-2.8
A	MILGO ELECTRONICS	15- 42	19	0	0.0
N	MOHAWK DATA SCI	15- 35	15 3/4	+1 1/4	+8.7
O	ON LINE SYSTEMS INC	8- 23	13 1/2	+2 1/2	+22.7
O	OPTICAL SCANNING	13- 52	15	- 1/2	-3.0
O	PHOTON	4- 17	9 1/4	- 7/8	-8.9
O	PHOTO-MAGNETIC SYS.	1- 6	1 3/8	0	0.0
O	POTTER INSTRUMENT	15- 42	22 1/2	- 1/4	-1.0
O	PRECISION INST.	6- 25	10 3/4	+ 1/4	+2.3
O	RECOGNITION EQUIP	18- 85	76	+2 1/2	+3.4
O	RENCOM CORP.	9- 34	9 1/8	+2 3/4	+43.1
N	SANDERS ASSOCIATES	7- 29	19 3/8	+1	+5.3
O	SCAN DATA	5- 33	7 1/4	+ 1/4	+3.3
O	TALLY CORP.	10- 35	14 7/8	+ 1/8	+0.8
N	TELEX	10- 25	18 7/8	+ 1/2	+2.7
O	VIATRON	1- 51	1 1/2	+ 1/8	+7.8
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 19	18 3/4	+ 3/8	+2.0
O	BALTIMORE BUS FORMS	8- 21	8 3/4	- 1/4	-2.7
A	BARRY WRIGHT	5- 25	11 3/4	+ 3/4	+6.8
A	DATA DOCUMENTS	15- 35	27 5/8	+ 3/4	+2.7
N	ENNIS BUS. FORMS	9- 19	17 1/4	+ 3/8	+2.0
O	GRAHAM MAGNETICS	4- 18	18	+2 3/8	+15.1
O	GRAPHIC CONTROLS	5- 17	8 1/8	+ 1/8	+1.5
O	MEMOREX	46-190	67 3/4	+ 1/4	+0.2
N	3M COMPANY	71-114	107 1/2	+1 3/8	+1.9

E X C H	1970-71 RANGE (1)	CLOSE MAR 11 1971	WEEK NET CHNGE	WEEK % CHNGE
O	MOORE GUS. FORMS	25- 39	38 1/2	+ 3/4	+1.9
N	NASHUA CORP	21- 43	36 1/2	+1 7/8	+5.4
O	REYNOLDS & REYNOLD	25- 48	47	+2 3/4	+9.2
O	STANDARD REGISTER	17- 30	22 3/8	+ 5/8	+2.8
N	TAB PRODUCTS CO	6- 12	11 7/8	+ 1/8	+1.0
N	UARCO	22- 39	27 1/4	+1 3/8	+5.3
A	WAGNER MAGNETICS	7- 30	9 3/8	+ 1/2	+5.6
N	WALLACE BUS FORMS	17- 43	21 1/2	+1 5/8	+8.1
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	78-173	112 3/8	+1 3/8	+1.2
N	COLLINS RADIO	8- 37	18 5/8	+1 5/8	+9.5
N	CONTROL DATA CORP	38-122	65	+6 1/2	+11.1
O	DATA GENERAL CORP	16- 59	30 7/8	- 5/8	-2.3
N	DIGITAL EQUIPMENT	50-124	92 1/2	-8 3/4	-12.2
N	ELECTRONIC ASSOC.	3- 11	7 5/8	+ 1/4	+5.5
A	ELECTRONIC ENGINEER.	3- 14	6 7/8	- 1/4	-5.5
N	FOXBORO	18- 41	39 3/4	+ 1/4	+0.6
O	GENERAL AUTOMATION	9- 42	23 1/2	+2	+9.3
N	GENERAL ELECTRIC	60-110	107 3/4	-1 5/8	-1.4
N	HEWLETT-PACKARD CO	19- 45	39 3/4	+2 3/8	+6.3
N	HONEYWELL INC	95-132	104 3/4	+4 3/8	+4.3
N	IBM	225-387	367 3/4	+7	+2.0
O	INTERNATA INC	3- 22	8 3/4	+ 3/8	+4.4
N	NCR	30- 86	65 1/8	+3 1/8	+7.9
N	RCA	38- 55	54 1/2	+ 1/2	+0.9
N	RAYTHEON CO	38- 99	58	+3 5/8	+10.2
N	SCI. CONTROL CORP.	1- 8	1 3/4	0	0.0
N	SPERRY RAND	19- 40	33 3/4	+ 1/2	+1.5
A	SYSTEMS ENG. LABS	10- 48	16	0	0.0
N	VARIAN ASSOCIATES	9- 29	17	+ 1/4	+1.4
N	WANG LABS.	18- 51	37 5/8	+4 3/8	+13.1
N	XEROX CORP	84-115	100 1/8	+5 1/8	+5.2
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	18 1/8	+ 1/8	+0.6
O	BRESNAHAN COMP.	2- 9	4 3/8	+ 5/8	+16.6
O	COMPUTER EXCHANGE	2- 9	8 1/8	+ 5/8	+11.3
A	COMPUTER INVSTRS GRP	1- 13	12 1/2	+1 3/8	+12.5
N	DATA PROC. FIN & G	8- 12	15 3/4	- 1/8	-0.7
O	DATRONIC RENTAL	2- 11	7 3/4	- 3/8	-12.0
A	DEARBORN COMPUTER	10- 34	34	-3 1/4	+10.5
O	DIEBOLD COMP. LEAS.	2- 9	8 3/4	+1 1/2	+20.6
A	OPAL, INC.	3- 10	6 7/8	+ 3/4	+5.7
A	ORANITE MGT	7- 22	11 5/8	+ 3/8	+3.3
A	ORDYNSKI COMPUTER	5- 14	10 1/2	+1 1/2	+16.6
N	LEASCO DATA PROC.	7- 30	20 5/8	+ 1/4	+1.2
O	LECTRO MGT INC	1- 9	3 1/2	+1	+40.0
O	LEVIN-TOWNSEND CMP	5- 18	6 1/8	+ 1/8	+2.0
O	LMC DATA, INC.	1- 4	7/8	0	0.0
O	MCC INDUSTRIES	5- 8	3 5/8	0	0.0
O	SYSTEMS CAPITAL	1- 5	1 3/8	- 3/8	-6.3
N	U.S. LEASING	3- 20	19	+ 3/4	+4.1

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; B=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

Computer Systems — Software & EDP Services
Peripherals & Subsystems — Leasing Companies
Supplies & Accessories — CW Composite Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/70

Earnings Reports

VIATRON COMPUTER SYSTEMS
Year Ended Oct. 31

	1970	1969
Revenue	92,478,121	8716,241
Loss	a30,203,933	9,471,815

a-Includes a charge of $8,004,000 for estimated inventory losses, vendor claims relating to terminated purchase contracts and inventory adjustments relating to excess quantities and obsolescence. Also includes extraordinary charges of $4,082,140 for estimated losses on disposition of fixed assets and settlement on termination of a real estate lease.

DEARBORN COMPUTER & MAR.
Three Months Ended Jan. 31

	1971	1970
Shr Erng	8.62	8.47
Revenue	9,058,000	8,570,000
Earnings	882,000	727,000

HONEYWELL INC.
Year Ended Dec. 31

	1969 (000)	1969 (000)
bShr Erng	$3.58	$3.76
Revenue	1,923,000	1,838,000
Earnings	c82,000	82,000
$3 Mo Shr	1.48	.....
Revenue	511,000	.....
Earnings	c25,300	.....

a-Preliminary; and with both 1970 and 1969 figures adjusted to account for the merger of GE's computer business into Honeywell on a pro forma basis, representing a partial pooling-of-interests reflecting the results of the merger. 1969 fourth quarter figure wasn't available on a comparable basis. b-Based on a larger number of common shares outstanding during 1970, as reported by company. c-Earnings in 1970 reflected changes from the accounting system used by GE to largely conform with the Honeywell basis, as of Oct. 1, 1970, which resulted in $8.2 million of earnings or 36 cents a share. Consolidated net earnings would have been well reseated in $1.2 million of earnings or 5 cents a share in both 1970 and 1969.

AMPEX CORP.
Three Months Ended Jan. 30

	1971	1970
Shr Erng	9.12	9.37
Revenue	82,953,000	90,332,000
Earnings	1,350,000	4,018,000
$ Mo Shr	.22	.68
Revenue	221,913,000	229,601,000
Earnings	2,844,000	11,444,000

TALLY CORP.
Year Ended Jan. 3

	1971	1970
Shr Erng	$8.11	$9.77
Revenue	14,019,000	$10,977,000
Spec Gain (Charge)	155,530	(185,080)
Earnings (Loss)	b351,920	(1,822,970)

a-Based on income before special credit. b-Equal to 60 cents a share.

HEWLETT-PACKARD
Three Months Ended Jan. 31

	1971	1970
Shr Erng	9.19	a9.22
Revenue	91,160,000	82,370,000
Earnings	4,903,000	5,556,000

a-Adjusted for a two-for-one stock split in February 1970.

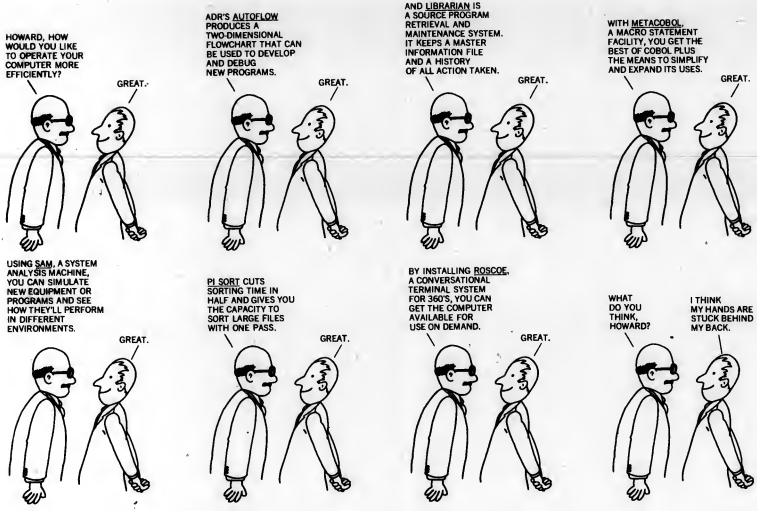
BALTIMORE BUSINESS FORMS
Year Ended Dec. 31

	1970	1969
Shr Erng	8.64	8.52
Revenue	17,295,625	18,312,594
Earnings	347,360	673,000

COMPUTING & SOFTWARE INC.
Three Months Ended Jan. 31

	1971	1970
Shr Erng	8.30	9.27
Revenue	19,053,000	18,445,000
Earnings	1,629,000	1,472,000

SECOND IN A SERIES:



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